Singularity2030 Dynamic Reference Book

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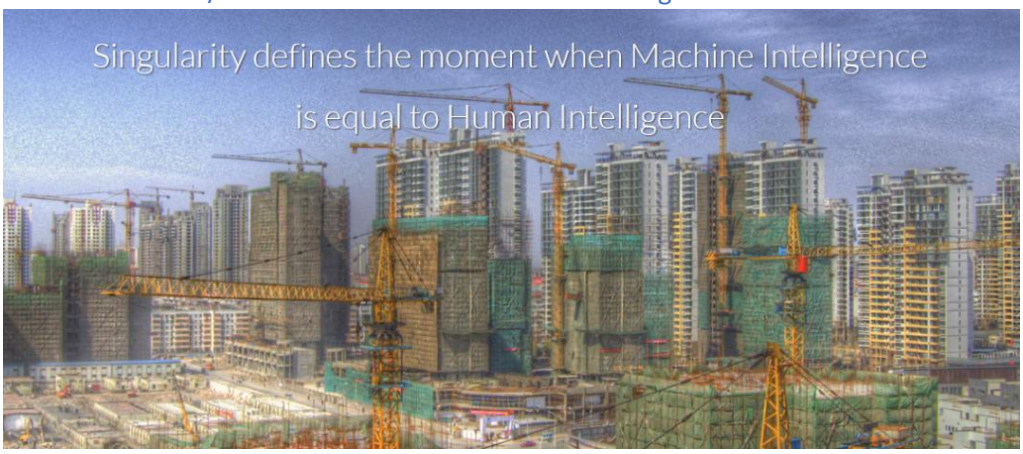

Introduction

With over 190 essays written since the launch of the 'Singularity2030' website in August 2016, the question often raised is why not writing a book about AI. Well, there are three answers:

> First, there are already many fascinating and interesting books available, covering various aspects of AI, ranging from technology, sociology, biology, neurology to psychology etc.
>
> Second, as AI continuous to develop exponentially, a book focusing on a specific AI-topic is partially outdated once published.
>
> Third, authors of AI related books are typically experts in a specific area of interest. As AI is expanding into every segment of human life, one book will hardly match the challenge in providing a general overview about the direction where AI is heading.

The goal of the Dynamic Reference Book is to provide a contemporary overview of AI development across the entire socio-economic and technical spectrum based on all essays published. It is updated every two weeks as a new essay is added to the website. The previews (summaries) of the essays make-up the content of the Dynamic Reference Book, providing a means, to easily browse through the AI world without the shortcomings of a static book. Under ***'More…'*** each preview can be linked to the essay as originally published. The order of entry in each subchapter is time-descending, contemplating the development of AI over time and leaving room for repetitive coverage on the same topic. To add structure to the essays and their previews, a classification schema is applied which segments the essays into 3 chapters each of which is divided into 3 subchapters as shown below:

Chapter 1:	AI-State-of-the-Art Issues	(Hardware / Software / Applications.)
Chapter 2:	AI-Research Issues	(Neuroscience / Psychology / Machine Intelligence)
Chapter 3:	AI-Consequences Issues	(Business / Society / Individual, Ethics)

Meggen, February 9, 2024
Peter Rudin

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Chapter 1

1.1 Hardware

Organoid Intelligence: A new Frontier in AI? *01.12.2023*

With better technology and a more nuanced understanding of the brain's physiology, researchers are building organoids that increasingly mimic the structure and function of the human brain. The emerging field of so-called 'organoid intelligence' aims to leverage the extraordinary biological processing power of the brain. Human brains are slower than intelligent machines, but they far surpass machines in processing complex information as brains deal better with few or uncertain data.
Artificial brains are man-made objects that are just as intelligent and creative as humans. No such device has yet been built. With the exponential growth of scientific knowledge this could happen in a few years.

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The Amazing Revival of Analog Computing *22.09.2023*

A new article from W.I.R.E.D., titled 'The unbelievable Zombie Comeback of Analog Computing' states that a new generation of analog computers will change the world of computing drastically and forever. The design of today's digital computers is based on the 'Von Neumann architecture'. For each calculation, the computer needs to shuttle data back and forth between CPU and memory which is highly inefficient. Progress in neuroscience and the design of neuromorphic systems based on analog chips will replicate the intellectual capacity of the human brain. With far less power, substantially less heat and better performance, analog computing might indeed challenge today's dominance of digital computing.

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Apple's AR/VR Headset: A new Paradigm in Computing? *16.06.2023*

After years of speculation Apple finally unveiled its headset. The outstanding feature of the Vision-Pro is that the user can switch seamlessly between Augmented Reality (AR) and Virtual Reality (VR).
The announcement comes years after other Big-Tech Giants have unsuccessfully tried to introduce high-tech headsets to the mass-market. Without much risk, Apple has introduced a great tool to test the market while working on a lightweight pair of glasses with similar features at a much lower price.
Next to gaming, AR/VR devices provide powerful tools to increase productivity. A research and technology is progressing we can assume that AR/VR applications indeed drive a paradigm-shift in computing.

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'Wetware': a New Approach to AI-Computing? *03.06.2022*

Biological cells generated from stem cells, can be used to provide the computational functionality of real neurons, providing so-called 'wetware' of living cells. Due to limitations of processing power and energy consumption of silicon-based computers, wetware- based cell-computing is likely to bring about a paradigm-shift in machine learning technology. Supported by Venture Capital, Start-Ups are driving the market with a vision, that within a few years, 10 billion neurons on a chip might be capable of processing our entire knowledge space. Answering the many related ethical issues is complex. We are confronted with a radically new phenomenon of science which humanity has not been exposed to.

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Neural-Nanorobots to Augment Human Intelligence *26.04.2019*

Human knowledge is being digitized at an exponential rate. Our biologically constrained cognitive abilities make it impossible to keep pace. Hence, as some see it, it is essential that we develop a secure real-time interface between the human brain and the data storage and processing systems that reside in the cloud. To others, numerous ethical implications clearly prohibit interfacing the brain with an intelligent machine connected to the cloud. Neural-nanorobots are expected to provide a non-invasive, secure and virtually autonomous real-time interface between the brain and the cloud. They can be applied via injection into the vasculature system to monitor the information passing between synapses and neurons.

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New Hardware-Technology will accelerate AI Progress *01.02.2019*

To advance AI and Deep learning further, three issues need to be addressed:
Time: It can take weeks to train deep-learning networks, engaging high-salaried individuals.
Cost: Computer time on hundreds of Graphic Processing Units (GPUs) for weeks is expensive.
Data: In many cases the lack of enough labelled data simply makes it impossible to carry out the project. To handle the raising complexity to solve these problems requires increased hardware performance. A three-way race is on the way, employing the following hardware technologies:
-High-Performance Computing (HPC), -Neuromorphic Computing (NC), -Quantum Computing (QC)

More….

A Computer Chip in your Brain is no longer Science Fiction *24.02.2017*

In an interview by CNBC on February 13, 2017, the well-known visionary and entrepreneur Elon Musk made the statement that humans must merge with intelligent machines or become irrelevant in the age of artificial intelligence (AI). To follow up on Elon Musk's vision, a brain-computer interface (BCI) is required as a communication pathway between the brain and an external device. Kernel Company, a U.S. science start-up founded in 2016 with an initial venture funding of USD 100 Million is building a tiny computer chip that can be implanted into the brain to help people suffering from neurological damage caused by strokes, Alzheimer's or concussions. Top neuroscientists who are building the chip hope that in the longer term, it will be able to boost intelligence, memory and other cognitive tasks.

More…

Quantum Computing, who wins the race for Supremacy? *28.09.2016*

Quantum computing chips are made up of devices called qubits that represent digital data using quantum effects. In the subatomic realm of quantum physics, particles can be particle or wave or particle and wave. This is what's known in quantum mechanics as superposition. As a result of superposition, a qubit can be a '0 or 1' but also a '0 and 1'. That means it can perform two equations at the same time. Two qubits can perform four equations. And three qubits can perform eight, and so on in an exponential expansion. Scott Aaronson, an associate professor at MIT, says a collection of just 50 qubits will likely be the first computer to demonstrate "quantum supremacy"—the power to solve a computational problem immensely difficult for conventional machines.

More…

Moore's Law coming to an End? Yes and No! *25.06.2016*

For 50 years the exponential growth of computer performance and inversely reducing its cost per chip has proven to be a reliable path for assessing the trend of hardware development and Machine Resources. Now due to limitations of silicon-based chip design this trend also defined as Moore's law is coming to an end. What happens next? In summary, it will be renewed by chips incorporating new materials and architectures, possibly outpacing the speed of change we have experienced in the last 50 years. This development will be largely fuelled by Artificial Intelligence applications and its requirement to handle and analyse huge data sets to support the Singularity- Ecosystem.

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1.2 Software

Simulating Societal Behaviour with Generative AI-Agents *06.10.2023*

In 2017 Google described transformers and generative AI as a concept of attention which refers to the mathematical description of how words relate, complement and modify each other. Generative AI-agents have the potential to act autonomously, and they can be programmed to sense their environment and to make judgements based on their past experiences. When assembled to create a network, they can emulate the more intricate societal behavior that emerges from the interactions of a large population. The application of generative AI-agents is not without risks. They could be used to create bots that convincingly imitate real humans, amplifying malicious activities.

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Combining AI with Robotics to Mimic our Brain? *11.08.2023*

By combining AI and robotics, we are in a position to construct machines that see, hear, feel, taste, touch and even think for themselves. Three research efforts are reviewed: a) Robots to Enhance Cognition of AI-Systems; b) Biological Neurons to Integrate AI and Robotics; c) The Sanctuary approach. Assessing today's AI-Supported Robot Applications there still exist some fundamental limitations such as a lack of human-like general intelligence or limited social interaction and empathy.

Which one of the different research efforts reviewed will advance AI-Robotics is hard to predict. Destructive applications such as killer-robots for the military or health-focused robots to perform surgery will provide new insights to the future of automation.

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AI Generated Content: Learning Models to Collapse? *30.06.2023*

What happens as AI-generated content proliferates through the internet and AI models begin to train on artificially generated content instead of content generated by humans? Content might suffer from irreversible defects as learning from data produced by previous models causes model collapse - a process whereby models forget the true underlying data distribution over time.

Researchers are turning to synthetic data to train their artificial intelligence systems because real human generated data can be hard and very costly to obtain. Microsoft has addressed these concerns, releasing a collection of 100'000 synthetic faces for training AI systems for face recognition and to reduce bias in vision-focused applications.

More…

The Six-Month Pause: A Wake-Up Call to Reposition AI? *21.04.2023*

As of March 22, 2023, more than 1'800 signatories, called for a six-month pause on the development of systems 'more powerful' than that of GPT-4. But what are the consequences that need to be discussed? Do we see the world as it really is or are we creating our own reality? To answer this question, we need to engage neuroscience and philosophy. Social reality is so powerful that it has influenced our genetic evolution. Hence, we might have more control over reality than we think and more responsibility for reality than we might realise or want.

Making reality the key benchmark, we should reassess AI's value: a powerful tool that needs to be managed, thereby assuring survival of homo sapiens.

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Our Brain is not a Computer, Perhaps a Transducer? *09.09.2022*

The computational model, comparing the brain to the computer, has been the most prominent metaphor in neuroscience and AI for decades. It implies that computers are very closely aligned to the functionality of the human brain. A new theory of how the brain works — the neural transduction theory — might upend everything we know about consciousness and the universe itself. According to this theory our bodies are completely encased by transducers.

The arguments to advance AI-research from a computer to a transducer metaphor are intriguing, especially in respect to causality. Our capacity to adapt will remain the limiting factor unless the quest for survival opens a new chapter in human evolution.

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From AI to AGI: New Developments to Narrow the Gap? *25.03.2022*

Despite six decades of research, we still do not have an AI that rivals the cognitive abilities of a human child, let alone one that can think like an adult. One of the solutions being explored to overcome the limits of AI is based on the concepts of neuro-symbolic systems. According to Joshua Tenenbaum, Professor at MIT, bridging the gap starts with exploring one of the fundamental aspects of intelligence that humans share: intuitive physics and psychology.

Other scientists believe that neural network models will eventually reach the reasoning capabilities they currently lack. In addition, many researchers are engaged in the design of deep learning systems that can perform high-level symbol manipulation without the explicit instruction of human developers.

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From Intelligence to Wisdom; what about Motivation and AI *04.06.2021*

Motivation is the process that initiates, guides and maintains goal-oriented behavior while wisdom represents the highest level of intelligence one could be motivated to achieve. Wisdom resists automatic thinking and grasps a deeper meaning of what is known but also understands the limits of knowledge. Hence, enhancing Artificial Intelligence (AI) with Artificial Wisdom (AW) will open new conceptual models for reaching human-level AI. The design principles for AW-systems are in line with the ongoing paradigm-shift in AI-research, moving from a deterministic massive data-driven, pattern-recognition model to a human-learning model.

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From Data to Predictions to Decisions *31.08.2018*

Recent developments in artificial intelligence (AI) and machine-learning in combination with large data-libraries significantly improve the quality and cost generating predictions. Prediction is one of the possible objectives of mathematical modelling in fields such as healthcare, economics and finance. Decision-making is the process of identifying and choosing alternatives based on the values, preferences and beliefs of the decision-maker. To get started with AI, the challenge is to identify the key decisions where the outcome is tied to uncertainty. While experts are mostly in agreement about the benefits of AI in healthcare, some doctors and academics are wary we could be headed in the direction of data-driven medical practices too fast.

More…

Design Issues of Conversational Expert-Avatars (CEAs) *13.07.2018*

In a bold move that could redefine the delivery of advice and the future of work itself, UBS has created a digital clone of its Swiss chief economist, Mr Kalt. The event marks the first time that a global bank has created a CEA by cloning a human staff member to be presented to clients to answer their questions. A CEA's level of expertise will eventually be superior to the expertise a human can comprehend. However, the human's ability to think across multiple layers of knowledge will remain unique. Once true Artificial General Intelligence (AGI) becomes available, this scenario might change as CEAs will be able to cover a broader range of expertise. So far however, we have a long way to go to reach AGI.

More….

AI-Empathy Improves Communication Skills of AI-Machines *29.06.2018*

Our ability to understand and relate to other people is, in part, a function of an empathetic process. According to Wikipedia, empathy is the capacity to understand or feel what another person is experiencing from within their frame of reference. Researchers and developers are creating algorithms that try to determine the emotional state of a human being, based on input such as gestures, facial expressions, text, and tone of voice. As AI rapidly advances its communication skills, persuasion and empathy are no longer an exclusive human asset. Artificial empathy is about to overthrow the idea that to communicate expertise and advice is best performed by humans.

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1.3 Applications

AI and Marketing with Mirror Neurons *09.02.2024*

Of all corporate activities, marketing has perhaps the most to gain from the application of AI. Adding Neuroscience by observing the brain activity of mirror neurons has created the term 'Neuromarketing'. Mirror neurons are activated when someone is performing a task, while at the same time, observing someone close by performing that same task. They form a bridge between empathetic marketing strategies and consumer engagement. In shaping consumer behaviour, marketers can design campaigns that resonate with consumers on an emotional level.

However, some claims have yet to be substantiated by research. Their discovery represents just a small piece of a puzzle which might eventually lead to a comprehensive theory about brain functionality.

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ChatGPT: Towards a New Industrial Age or Plenty of Hype? *10.02.2023*

OpenAI's ChatGPT is now the fastest-growing app in human history, reaching an estimated 100 million active monthly users in just two months. It is also considered a stepping-stone to new applications way beyond typical natural language processing tasks. According to Yann LeCun, head of Meta Research, ChatGPT is composed of multiple pieces of technology, developed over many years by many parties. It is not revolutionary and certainly overhyped. One of the problems with large language models is their ability to generate false and misleading content.

Only sustainable user-acceptance will prove that humanity has indeed reached a revolutionary level of a new industrial age.

More…

AI in 2023: Innovation Continues with no End in Sight *30.12.2022*

Yann LeCun, chief AI scientist at Meta, recently expressed concern that the dominant research of deep learning will not achieve 'true' intelligence. Demis Hassabis of Deep-Mind noted that – like an idiot savant - many AI programs could only do one thing well. Geoffrey Hinton believes that In the future we will see a completely new type of 'mortal' computer, where the knowledge that the system has learned and the hardware used, are inseparable.

According to the Philosopher David Chalmers, it is likely that in a decade from now, the leading AI programs might have a 20 percent or better chance of being conscious.

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From Digital Twins to the Metaverse, a Paradigm Shift in AI? *21.10.2022*

The concept of 'Digital Twins' has emerged as a promising technology to enhance current AI-Applications.

The implementation of a digital twin is represented by an assembly of software that mirrors the structure of a unique physical object, a process, an organization or an individual.

Adding the 3-D space provided by the metaverse and its augmented and virtual reality tools, digital twins provide new insights for solving problems at the corporate as well as the individual level.

Getting there will take time. With advancements in hardware performance and data analytics, a ten-year timeframe seems realistic.

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Transformers to Improve Memory, a Paradigm Shift in AI? *23.09.2022*

Our memory is engaged when we try to distinguish between the mental and the physical world. The brain does not represent information - it constructs it. Transformers use a mechanism called self-attention, to detect textual relationships in a series of words and sentences that depend on each other. Neuroscience research suggests that transformers can mimic brain functionality. Improving the accuracy of memory with a neural foundational model implemented with an intelligent machine, might indeed signal a paradigm shift in AI. To overcome the complexity, moving from a machine- to a human-centered AI, the Stanford University's Institute for Human-Centered Artificial Intelligence (HAI), suggests more multi-disciplinary research.

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Does Art Implicate a New Approach to AI? *20.05.2022*

Although there are many more forms of art, literature and music are especially well suited to discuss the application of AI as both can be digitally produced and distributed (Books, CDs, Video-Streaming). Literature is the art-form of language and words are its tools while Music is the art-form concerned with combining vocal or instrumental sounds.

While AI provides tools, there are limits how far they can support the process of composing art. The fact that mathematics represents an intrinsic part of music and the same holds true for AI as well, demonstrates that integrating the disciplines of natural sciences and the humanities presents a potential path towards a new form of man/machine interaction, with creativity representing human's most valuable contribution.

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AI and Art; Beethoven's Tenth Symphony: Paradigm Shift? *11.05.2021*

When Beethoven died in 1827, only a few handwritten sketches for the creation of his tenth symphony existed. To mark the 250th anniversary of his birth, German Telekom put together a team of experts with the request to finish Beethoven's tenth. Creativity is as much part of human's assets as our cognitive capability for solving problems. AI can augment the human process of creating Art but by its own, intelligent machines just imitate existing Art, based on algorithms that detect patterns.

While the distribution of digital art is rapidly growing - tightly connected to blockchain-technology - experiencing the emotionality of Art is likely to remain a fundamental asset of human existence.

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With Self-Reflection to better Decisions, what about AI? *21.05.2021*

Self-reflection is a process of communicating internally with oneself. Sensing and recording of this process provides a means for developing an intelligent 'robot' that mirrors our own life experiences, interacting with the outside world similar to the way a child learns. Realtime sensing of behavioral, and physical body data is rapidly advancing. The primary design-goal of this 'robot' is to support humans to overcome limits of learning and to provide support in the decision-making process. Motivation and purpose have to remain the driving authority that controls this process. How much authority we want to give these 'assistants' in carrying out specific tasks is up to us, respectively the organization engaged in AI-supported automation.

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Impact of Brain-Computer-Interfaces supported by AI *09.04.2021*

Brain-Computer-Interfaces (BCIs) read and interpret brain activity. To handle the massive influx of data, AI is used to detect neural patterns and provide feed-back. At the 2017 World Government Summit, Elon Musk suggested that humans should merge their biological-intelligence with machine-intelligence to enhance their cognitive and sensory abilities, fighting-off the supremacy of future super intelligent machines. To prevent misuse, tough legal constraints need to be enforced to regulate the potentially positive as well as the potentially negative implications of neural augmentation. Considering what has become reality from past dystopian visions as suggested by Huxley and Orwell, there are good reasons to be alarmed.

More…

Decision Making: AI and the Limits of Common-Sense *01.01.2021*

Common-sense represents all the background knowledge we have about the physical and social world absorbed over our lives. It includes such things as our understanding of basic physics as well as our expectations about how humans behave. Based on common-sense, a heuristic is defined as a mental shortcut that allows people to solve problems and make judgments quickly and efficiently. While heuristics can speed up the decision-making process, they can introduce errors.

Common-sense reasoning is considered the holy grail towards the goal of reaching human-level AI. While, so far, AI has not succeeded to overcome this barrier, there are indications that AI will eventually support various decision-making scenarios.

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From AI to the Artificial Brain, are we Ready to Adapt? *11.09.2020*

Artificial brains are man-made machines that are just as intelligent, creative and self-aware as biological brains. No such machine has yet been built and to some scientist's view, artificial brains will never reach the functionality level of biological human brains. Based on the exponential growth of scientific knowledge, however, this could happen sometimes within this century, raising the question how humans will adapt to this evolutionary milestone. Our current philosophical and psychological inventory lacks the capacity to comprehend the impact of this achievement. Consequently, strong ethical guidelines of self-regulation are required. Otherwise, humanity runs the risk of becoming slaves of its own creation.

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AI and Mental Health: Repowering Psychology? *03.07.2020*

The idea of human interaction being replaced by AI was first applied 35 years ago with ELIZA, a natural language processing program, created at MIT by Joseph Weizenbaum. Emotion sensing did not exist and in this respect, it is astonishing that AI-support for therapeutic counselling is still at a very early stage. Therapeutic AI can free up doctors to work more with their patients, handling administrative tasks and even assisting with diagnosis or intervention. In addition, empathy focused AI-applications can help patients to create awareness of their own emotional states. Mutual trust in AI-conversational therapy is an absolute prerequisite to advance the market further. Without the adherence to ethical standards and the protection of privacy, trust cannot be achieved.

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AI: From Isolation to Social Distancing and Beyond *08.05.2020*

The COVID-19 pandemic has caught humanity largely unprepared. While its devasting effects will be felt for a long time, the potential contribution of AI to better handle the outbreak of pandemics is very much apparent. Experience and lessons learned show that isolation and home-based video conferencing reduce team efficiency and increase mental stress.
Location based big data analytics and contact tracing help to contain a pandemic outbreak. Monitoring our health with body sensors and AI based interpretation tools will put us in a much better position to emotionally counteract the paralyzing effects of fear. Finally, rapid drug and vaccine development complements the AI tools, reducing the physical, mental and economic damage a pandemic can cause.
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The Evolution of Artificial Collective Intelligence (ACI) *10.01.2020*

Members of the first human groups shared the instinct to combine their respective information and expertise to meet survival tasks they could not possibly meet individually. Those early forms of collective intelligence (CI) gave rise to language and tools which, in turn, enabled new forms of collective intelligence that could absorb more existential complexity. According to Thomas Malone, Director of the Centre for Collective Intelligence at MIT, web-based software tools allow people to interact and collaborate in new ways. The relationship between CI and AI defines ACI as a new research area with a few major drivers. One issue that must be solved relates to the problem of digital identity. We must create an identity system in which human beings can control their identity.
More…

From Data-Centric to Human-Centred AI *29.11.2019*

In his most recent book, “Human Compatible”, Stuart Russell takes on the challenges of AI to issues such as human purpose, authority and basic wellbeing. The major challenge ahead is to move AI from a data-centric to a human-centred approach, also referred to the creation of a General-Purpose AI (GAI). Leveraging data and people’s expertise in new ways offers a path forward for smarter decisions, more innovative policymaking, and more accountability in governance. Collective Intelligence, augmented by AI, is likely to enhance the development of human wisdom, enriching our individual life vis-à-vis the ever-growing complexity of scientific discovery and its impact on our society.
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An Integrated Approach to Apply AI in Decision-Making *04.10.2019*

Artificial Neural Networks (ANNs) and Machine-Learning Algorithms (Deep Learning) are applied to detect deviations from a given norm or to predict outcomes based on the analysis of historic data. However, this neuroinformatic, mathematical approach to simulate the human brain is reaching its limits. Decision-making provides one good example how the application of integrated AI (neuromathematics, neurobiology and neurophilosophy) can improve the decision-making process.
Regardless which process is applied - rational, intuitive or emotional - understanding the functionality of the human brain holds the key to enhancing the quality of human decision-making.
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Human-Centered AI to accelerate Educational Innovation *21.06.2019*

As science continuous to advance in high gear, the pace of knowledge-generation requires a revamp of our educational system. Human-centered AI is crucial in supporting humans in lifelong learning. Both the content to be taught as well as the technological means to educate, will disrupt the current business model of our educational infrastructure whose foundation goes back to the middle ages.
The application of AI in education will improve the quality and retention rate and significantly lower the cost, a typical scenario for well-funded Start-ups and Spin-offs to incubate a new age in lifelong, personalized education.

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AI to Strengthen Consciousness and Decision-Making *12.04.2019*

In our decision-making process, we seek external information to guide us. This includes the advice and opinions from people we know, people with expertise in the field or people we can trust. To foster consciousness is vital if we are to maintain our mental independence in a digital world where fake information and malicious influencing are threatening the very foundation of our democratic society. Augmenting humans by applying interactive Generative Adversarial Networks (GANs) can improve conscious experience as a means of making sound decisions against the destructive use of AI. Individuals who consistently make good decisions may not be the ones who are the smartest or the luckiest. They are the ones who thoroughly understand themselves.

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The Human Brain and Neuromorphic Computing *29.03.2019*

Neuromorphic systems offer two major promises: First, because they are pulse-driven, potentially asynchronous, and highly parallel, they could be a gateway to an entirely new way of computing at high performance and very low energy. Second, they could be the best vehicle to support unsupervised learning—a goal that may prove necessary for key applications such as autonomous vehicle navigation in unchartered areas or natural-language comprehension. What neuromorphic chips can do is to provide self-learning without requiring large datasets as in convolutional artificial networks. The system learns similar to the way humans learn.

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From Emotional AI to Artificial Human Avatars *28.09.2018*

Trust and empathy are the key quality factors in conversational avatar communications. While trust is associated with the credibility and data-security of the avatar service provider, empathy relates to the communication skills of an avatar. An avatar in his role as an artificial human has a distinct personality, possibly virtually copied from a real-life individual. The personality of the avatar must convey sympathy and competence and match the role a human would have in the "real"- world. The conversational avatar, acting as an artificial human, defines a new scenario of intelligent machine communication, possibly as far reaching as the launch of the internet 25 years ago.

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Conversational Avatar-Experts are about to arrive! *20.04.2018*

Intelligent avatars as virtual copies of experts, conversationally sharing their knowledge, have enormous potential.

With a total value of around $250 billion in 2016, the global consulting sector is one of the largest markets within the professional services industry. A machine-driven expert and his ability to appear in multiple copies via internet, will bring down the cost of professional advice to a fraction of what it is today. The first movers of an avatar-based consulting company are likely to disrupt the entire global consulting sector.

More…

What happens when my Digital Assistant has an IQ of 300 *12.01.2018*

To enhance human intelligence with machines to reach an IQ level of 300 is a thought-model which does not imply a God-like internet or Superintelligence as discussed in Nick Bostrom's book. The IQ is an index by which we measure cognitive intelligence. The availability of AI tools to augment human intelligence towards a higher IQ level has primarily economic consequences, for example disrupting the billion-dollar consulting industry of McKinsey and Co. A similar disruption occurred when the introduction of mechanical machines and systems enhanced the physical limitation of humans as it happened to the farming industry around 1920.

More….

AI for Automated or Augmented Decision-Making *29.12.2017*

Artificial intelligence is more than the simple automation of existing processes: it involves, to greater or lesser degrees, setting an outcome and letting a computer program find its own way to get there. It is this creative capacity that gives artificial intelligence its power. Generally, we can expect that AI supported decision-making will lead to better decisions, provided that the data used by machine learning is trustworthy and ethical standards are met. To define these standards and to implement controls of adherence and data quality are fundamental for reaping its potential benefits.

More…

With Neuroscience and AI to Conversational Learning *25.08.2017*

Classroom teaching with the large amount of knowledge educators have to transfer leaves little room for conversations. Yet it is widely recognized that formal lecturing and reading has a combined learning retention level of less than 20%. As neuroscience and AI are beginning to complement each other, new learning algorithms like 'reasoning' and 'relationship learning' or new brain-inspired neural learning models are being developed. Imagine you have a 24 hour/7-day access to an artificial personalized coach, answering questions about a topic you just learned in school or via MOOC- learning will be much more fun. The retention level will substantially increase and your motivation for life-long learning will remain high.

More…

AI to Support Personal Development *16.06.2017*

Deep machine learning, speech recognition, emotion and body sensing have dramatically progressed, empowering voice activated PDAs such as Amazon's Alexa, Apple's Siri, Google's Now, and Microsoft's Cortana. These virtual assistants will continue to improve until they become hard to distinguish from real people. Interacting with 'humanized' technology in the context of therapy and coaching will turn our devices into 'identity accessories': they will become tools to actively guide our behaviour and identity based on goals we provide. The availability of virtual assistants that interact on issues we so far considered uniquely human will raise profound scientific, psychological, philosophical, and ethical questions.

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AI and the Sensing of Human Emotions *19.05.2017*

Emotion sensing can enhance personal profiling applied in business applications such as marketing, health care, education or consulting. Machine emotional intelligence is still evolving, but the future could soon see targeted ads that respond to our current emotional state as well. In addition to business applications, emotion sensing also provides input to the emerging field of personal analytics empowering individuals to analyse and exploit their own data to achieve a range of objectives and benefits across their work and personal lives. As systems take on new therapy and coaching functions collecting an increasing amount of personal data about us, concerns about privacy and ethics will grow.

More….

Who will provide your Virtual Personal Assistant (VPA)? *28.10.2016*

The race is on among the big tech companies like Google, Microsoft, Apple, Microsoft and Amazon to become the preferred supplier of your VPA. Who controls the VPA gateway will greatly influence the relationship to all services a customer might want? Like the browser wars of the 1990s, the outcome will lead to settling the balance of power in the next phase of the internet. By channelling attention and making decisions on behalf of their users, VPAs will have a significant impact to make or break other businesses already engaged in providing internet services. One key in this development towards a VPA is the application of machine learning to language comprehension both in respect to content and context and the support of voice assistants to provide the interface to language-oriented services.

More….

Cognitive Computing and Decision-Making *01.06.2016*

Daniel Kahneman, one of the first researchers engaged in Neuro Economics was awarded the 2002 Nobel Prize in Economic Sciences based on his findings challenging the assumption of human rationality prevailing in modern economic theory. Since this time, efforts to understand the functioning of the human brain also in respect to decision-making have increased exponentially. With 'deep learning' algorithms we are capable of interpreting textual content and to propose answers to questions raised. The term 'Cognitive Computing' defines a new era of computing which combines AI with big data analytics. It can be a very powerful tool to improve our decision-making process and to support leaders to plot a successful future in a complex economic environment.

More….

Can AI judge our State of Happiness? *15.06.2018*

Even though AI systems are no substitute for interactions with a real human, they could have the potential to improve our quality of life and enhance our emotional intelligence. The 'happimeter' app is a new player on the block of personal analytic service providers. New is the combination of a smart watch with a smart phone and the focus on happiness with an algorithm that executes input data provided by the sensors of the smart watch combined with environmental information from the smart phone. The 'happy meter' and its analytical capability evokes the question if AI's current development path is approaching a brick wall.

More….

Chapter 2

2.1 Neuroscience Research

Certainty and Probability: The Impact of Neuroscience *26.01.2024*

Certainty is something that is known to be true without any doubt and can be proven or verified. For example, the statement '2+2=4' is a proof of certainty. In contrast, Bayes' theorem of probability can help us to determine the degree of certainty we assign to a claim based on available evidence. Some neuroscientists propose a Bayesian brain theory which assumes that the brain encodes beliefs as probabilistic states to generate predictions based on sensory input and continuously uses errors encountered by the predictions to update its beliefs.

As neuroscience continues to advance exponentially, we can expect more answers to the question if the functionality of our brains does indeed follow Bayesian principles.

More…

Neuroscience+Language: Strong Alliance to Enhance GPT-4 *02.06.2023*

Language is a structured system for communication based on grammar and vocabulary. It is the primary means by which humans convey meaning, both in spoken and written forms. Humans acquire language through social interaction in early childhood and speak fluently when they are about three years old. Scientists engaged in computational neuroscience use simulations and mathematical models to develop an insight how the brain functions to generate language.

Language - next to vision and touch - is human's most important asset. Yet, tools like GPT-4 do not cover the deep-rooted power of language. Competence without comprehension is useless.

More…

The Story behind the Creation of a Politthriller *27.01.2023*

Dear Reader, with close to 170 Essays written over the last 6 years, about a year ago I had this creative urge to write a Politthriller, different from a conventional crime-novel. To build-up suspense in a deadly scenario between the secret services of CIA, KGB and MI5 to obtain control over a Nanobot-Based Neural System with military application potential is rather challenging.

Under 'Jetzt Probelesen' the BOD-Verlag provides a preview (in German) without obligation to buy:

Verrat in einer ehemaligen Alpenfestung (bod.de)

If you like to receive some background information about the creation of this highly relevant book, please follow the link below:

More…

Neuroscience and IoT: A Paradigm Shift? *03.12.2021*

Brain functionality can be defined as a combination of cognitive (thinking) and perceptive (sensing) capabilities. Hence, the human brain is regarded as a 'prediction machine' that assembles its own image of reality through inference. Mapping this capability with new sensor technology, implicates a major shift in the architecture of IT-systems that represent the backbone of today's corporate infrastructures. As IoT will massively increase the number of nodes accessible by the internet, the volume of behavioral data will 'explode'. We are moving from a reaction- to a prediction-economy with far reaching implications.

More…

Neuroscience, its Impact on AI and Beyond *10.09.2021*

With the ongoing progress in Neuroscience and brain research, the question looms if ANNs current models and its algorithms need not to be adjusted based on new knowledge about our brain's functionality. The existing concepts of mimicking the human brain for achieving human-like intelligence need an overhaul. As result of the huge research efforts engaged in cracking the neural code, we will witness the deployment of new AI-products and services. Economic concerns and the continuing demand for higher productivity will drive this change. Likewise human concerns as we experience them today with issues about guaranteed income, distribution of wealth, ethics and government control will intensify.

More…

Human-Level AI: A Transdisciplinary Approach is Needed *20.04.2020*

The aim of artificial intelligence (AI) is to augment or substitute biological intelligence with machine intelligence. The rising complexity to achieve this goal calls for a transdisciplinary approach integrating various research areas. Collaboration between Neuroinformatics, Neurobiology and Neurophilosophy is fundamental to overcome the ongoing expansion of knowledge-silos we can observe in traditional university research settings. The availability of new broadband communication and virtual-reality simulation tools support the effort to establish highly efficient challenged based research teams, revolutionizing knowledge creation.

More…

Can AI + Neuroscience Decode the Human Brain? *06.03.2020*

There are several theoretical approaches to brain functions, including one to the most mysterious thing the human brain can do – producing consciousness. But so far none of these theories are widely accepted, and none has yet passed the decisive test of experimental investigation.

The implications of machine intelligence, for the process of doing science and for the philosophy of science, can be immense. With predictions obtained by methods that no human can understand, can we deny that machines have better knowledge? If prediction is in fact one of the primary goals of science, how should we modify the scientific method and the algorithms that for centuries have allowed us to identify errors and correct them?

More…

Research to Overcome today's Limits of AI *24.01.2020*

The obsession with creating bigger datasets and bigger neural networks has side-lined some of the important questions and areas of research regarding AI. We need new models to advance AI.

Artificial neural networks rely on the point model, treating neurons as nodes that tally inputs and pass the sum through an activity function. Neuroscientists have discovered that dendrite compartments which are part of a neuron can also perform computations that mathematicians had categorized as unsolvable. Lack of causality is one of the shortcomings of current machine learning systems. Systems that compose and manipulate named objects and semantic variables with causal structures will overcome these limits of AI.

More…

AI and Consciousness, from Philosophy to Neuroscience *20.09.2019*

Whether consciously aware or unaware, the brain correlates and selects information, associate's meanings, and influences motivation, value judgment and goal-directed behaviour. It is the combination of neuroscience getting involved in studying consciousness and philosophy becoming more open to studying natural sciences, including neuroscience, that has brought about a more promising research environment leading to the emergence of neurophilosophy. The most powerful artificial intelligence algorithms remain distinctly un-self-aware, but developments towards conscious thought processing are already happening, eventually providing a conscious machine**.**

More…

Artificial Intelligence to Accelerate Brain Research *05.07.2019*

Artificial intelligence has been borrowing knowledge about the brain's functionality since its early days, when computer scientists and psychologists developed algorithms called neural networks that loosely mimicked the brain. Those algorithms were frequently criticized for being biologically implausible. Complementing the effort to model neural activity in the brain through biological experiments, one can train deep-learning networks to solve problems the brain needs to solve. As a result, our knowledge about the biology of human brains and its AI data-scientific interpretation sets the stage for solving one of the last mysteries of human physiology.

More…

Advancing AI with Neuroscience *12.10.2018*

Today, most AI systems are based on layers of mathematics that are only loosely inspired by the way the human brain works. Different types of machine-learning applications require different mathematical structures, and the resulting algorithms are only able to perform very specific tasks such as speech recognition or the identification of objects.

While there are many domains where AI is superior, humans still have an advantage when tasks depend on the flexible use of memory. If we can understand that mechanism, the hope is that we can replicate this process with a new generation of neuroscience-inspired AI systems for rapidly solving novel problems.

More….

Has Machine-Learning Become Alchemy? *23.03.2018*

With this provocative title, Google's Ali Rahimi gave a critical assessment of the state-of-the-art in machine-learning at the 2017 Conference on Neural Information Processing (NIPS). There are increasing signs from the machine-learning community that AI needs another wave of innovation.

This wave should include contextual intelligence beyond the current statistical, algorithmic interpretation of data. Common-sense is regarded as the holy grail of AI and it is the precondition to reach Artificial General Intelligence (AGI).

More…

Reverse Engineering the Human Brain *22.09.2017*

The human brain is the most elementary biological component of our socio-economic system yet very little is known as to how it functions. Some researchers believe that it makes no sense to reverse engineer something we don't understand. Regardless of these critics, heavily subsidized efforts are in full swing to crack the neural code and to find out how our brain works. Today's neural networks as applied in AI machine learning software have little in common with biological neural networks. In the context of AI, neural networks provide the software architecture to process huge amounts of data concurrently, while mathematical techniques and algorithms are used to extract 'knowledge' from this data, mimicking some limited functions of biological neurons.

More….

Unlocking Knowledge Silos with Neuroscience *10.02.2017*

Extending scientific analysis to every subject und opening a potentially unlimited succession of research activities is producing a steadily growing number of hierarchical knowledge silos. The continuous progress in neuroscience will accelerate artificial intelligence research and the continuous creation of accessible machine knowledge. This knowledge is mapped in networks equivalent to the brain hence hierarchical knowledge silos are no longer needed. We must learn to open our mind asking the right questions as opposed to cramming silo-knowledge into our overloaded brains. The brain's capacity has limits, and it makes far more sense to employ human brains with knowledge tied to emotions and leave rational and logic-based memory up to machines.

More…

How to communicate with our future personal assistants? *30.08.2016*

The idea that a computer takes on the role of a personal assistant has been around for many years. The smartphone and its internet access to 'the cloud' has become our mobile companion with Apps available to provide instant personal advice ranging from travel planning all the way to health issues to name just a few. A truly personal assistant, however, has to be able to communicate like a human being in a language that is considered agreeable. Today we lack the algorithms that enable Artificial Intelligence Machines to handle this task. However, as neuroscience and brain research progress at such a rapid pace we will eventually understand how human language comprehension is built up and maintained.

More….

2.2 Psychology/Philosophy Research

Can GPT-4 Perform Reasoning Similar to Humans? *12.01.2024*

There is an ongoing debate whether Large Language Models (LLMs), as supported by GPT-4, are capable of replicating human reasoning. Human reasoning refers to the cognitive process of making sense of the world around us, drawing conclusions for solving problems. Machine reasoning is represented as logical rules, knowledge graphs or text evidence with algorithms to manipulate knowledge for problem-solving. Despite its progress, GPT-4's performance remains well below the high level of human's reasoning ability. Yet, today's trajectory of advancements in AI, points to a deepening symbiosis between human and machine reasoning where our thoughts might seamlessly intertwine with algorithms.

More…

The Myth and Reality of Artificial General Intelligence (AGI) *15.12.2023*

The concept of Artificial General Intelligence (AGI) has been influenced by various thinkers, but we are still far away from AGI, considered the 'Holy Grail of AI' that scientists have been dreaming of for decades. Embodied cognition can give us an explanation regarding the process through which infants attain spatial knowledge and common sense to reach AGI. However, there is a gap between the myth and the reality of AGI. The myth of AGI is based on ideas which may not hold true. The reality of AGI is much more complex with questions that need to be addressed before AGI can become a reality. The future of AGI is hard to predict, but it is likely to have profound implications for humanity and society. It could be of great benefit or great harm, or both.

More…

The Power of Intuition in Scientific Discovery and AI *25.08.2023*

Intuition is the ability to acquire knowledge without recourse to conscious reasoning. Often referred to as 'gut feeling', intuition tends to arise holistically without awareness. According to Einstein, intuition played a fundamental role in the discovery of quantum mechanics, considered the turning point for modern physics. With the recent introduction of GPT-4 and Generative AI we are about to enter the augmented age where the intuitive capabilities of humans are augmented by computational systems.

The question can be raised, however, if we are not entering a phase where an overhyped bubble will burst similar to the dot-com crash in 1999.

More…

Truth and AI: Can Emotional Intelligence (EQ) Restore Trust? *19.05.2023*

To overcome the current AI-credibility problem imposed by technologies like GPT4, applying the EQ (Emotional Quotient) offers one solution to tackle the problem of truth to restore trust in AI.

Daniel Goleman suggests that the EQ might be more important than the IQ because this standard measure of intelligence is too narrow, and the IQ does not encompass the full range of human intelligence.

Just as the IQ defines one's ability to process information, the EQ defines one's ability to process emotions and to make sound decisions. The dual approach to promote IQ and EQ as part of corporate development promises to restore trust and free up resources needed to successfully apply AI.

More…

If AI-Machines Reach Consciousness: A New Reality? *24.03.2023*

Scientists and philosophers have long argued that machine-consciousness will be possible. If we surpass this space of consciousness, what happens next?

To C.G. Jung, synchronicity is the belief that events are meaningfully related not by cause and effect as applied in AI, but by some other mysterious principle. David Calmers concludes that simulated creatures already vastly outnumber real ones, and that it is more likely that we are living in a simulation rather than in the original version of our world.

According to Nick Bostrom the probability that we are living inside a computer simulation is extremely high. Only time will tell, if utopian or dystopian science fiction scenarios will become our new reality.

More…

Do AI-Machines Have A Mind? *18.11.2022*

The mind can be defined as one's capacity to be aware of the world, and to experience and feel with the faculty of consciousness and thought. Biologists argue that the mind does not exist because there is no physical structure called the mind and that the brain will ultimately be found to be the mind.

Today's favourite metaphor defines the mind as a computer. We tend to think that perceptual experiences tell us what the external world is all about, without being influenced by our own mind.

We are waiting for the AI-machine's own mind to hand down the terms for what it considers to be intelligent. However, to attribute the wrong kind of mind to AI-systems might produce wrong conclusions.

More…

Does Reality exist or is our Perception just an Illusion? *28.02.2022*

Getting at questions about the nature of reality is an endeavour that engages the boundaries of neuroscience and fundamental physics. Philosophers have been trying to figure out what's real and what's not in practically all of the world's great philosophical traditions. The answers are often not that clear and developing philosophical theories is more difficult today as the issues are more complex.

Considering Donald Hoffmann's scientific view that human perceptions of reality are all illusions or David Chalmer's philosophical theory that simulation of a virtual world implicates a new reality – we have no choice but to resort to common sense as a reflection point to differentiate reality from virtuality.

More…

Metaverse: From Reality To Digital And Beyond? *19.11.2021*

To some the metaverse is nothing but Big-Tech's marketing gimmick to sustain their highly successful business-model of monetizing user's behavioral data. Following the idea that dreams have an analogy to virtual experiences, it comes as no surprise that the metaverse implicates an enormous capacity for 'dreamlike' experiences beyond reality. The metaverse may eventually come to define how we work, learn and socialise. In that respect its potential to influence our decision-making is enormous. The questions looms whether individuals should let themselves be 'seduced' to experience the artificial life as a source for decision-making, instead of using their own imaginative and creative capabilities.

More…

Just turned 80 - reflecting on Aging and AI *13.08.2021*

Aging is a life-long process, the foundations of which are laid in childhood. A relentless drive to explore the effects of AI-focused scientific and technological achievements are typical traits of my personality. Hence, reflecting about aging is an obvious topic, especially at the moment when one passes a milestone like turning 80, as I did just few days ago. In the not-too-distant future, however, perhaps 90% of my Essay writing - from content research to content creation - will be delivered by intelligent machines. As this technical achievement will set loose plenty of my creative energy, I have decided to write an AI-thriller centered around a former WW2 Swiss mountain fortress as location of a highly secretive AI-lab, missioned to crack the neural code. Work on this exciting project has started, hence stay tuned!

More…

Is AI Changing Maslow's Pyramid of Needs? *Revised Version* *16.07.2021*

Abraham Maslow's theory of human motivation, now over 80 years old, continues to have a strong influence on business and economic issues. Although the paper was written for psychologists, it has created a significant impact on management theory. In contrast to Maslow's hierarchy of needs towards self-actualization, one can apply an intelligence-focused view, where wisdom represents the highest level of human fulfilment The mindset of Maslow's hierarchy remains valid, provided the basic-level needs are expanded with internet connectivity. The challenge we face is to explore the 'mystery' of wisdom with psychological, philosophical and scientific expertise, including AI.

More…

With Embodiment and Sensors to AGI? *02.07.2021*

Embodied cognition, the idea that the mind is not only connected to the body but that the body influences the mind as well, is a rather new concept in cognitive science. Research shows that embodiment and learning correlate in achieving cognitive intelligence. Going one step further, DeepMind, Alphabets' AI research unit has set forth the hypothesis that the promise of awards will enhance this learning process with AI based reinforcement learning. However, there are other intelligences which are beyond cognition, supporting the fact that across the entire spectrum of human's intellectual capacity, humans cannot be replaced by intelligent machines.

More…

AI and our Capacity to Think about Thinking *06.11.2020*

Our minds have evolved to think so that we can better adapt to our environment and make smarter decisions on how to survive. At a biological level, our thoughts are millions of neurons firing off in our brains. These brain cells working together create concepts and knowledge that arises in our consciousness. In 1985, AI-Pioneer Marvin Minsky pointed out that the question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without emotions. As neuroscience and related behavioural analysis are accelerating intelligence research, the functionality of the human brain is seen as guide in advancing AI towards human-like intelligence. Along this process the human capacity to think and to rethink has become an important design factor.

More…

AI to enhance Human Imagination - what about Reality? *17.07.2020*

Human imagination occurs as a mental state and is a prerequisite for creativity and innovation. To understand the distinction between what is real and what is imagined is an important step in the development of children's imaginative abilities. How does your brain produce an image of something you have never seen? That may not seem hard, but it turns out that this is a complex problem that requires sophisticated coordination inside your brain.

One of the computational processes that provides AI with imaginative powers is referred to as Generative Adversarial Networks. They consist of two neural networks which compete against - and learn from - each other.

More…

AI to Augment Creativity for Better Decision-Making *05.06.2020*

According to research conducted by Dr. George Land, adults are 'grown up children' who have lost their creativity because creativity has been buried by rules and regulations. In the age of AI, our great distinguishing capacity vis-à-vis intelligent machines is creativity. A recent PwC report explains, "The rise of artificial intelligence is driving a new shift in value creation focused on sentiments more intrinsic to the human experience. Creativity is a skill that can be developed and a process that can be managed. It begins with a foundation of knowledge, learning a discipline and mastering a way of thinking. We learn to be creative by experimenting, exploring, questioning assumptions, using imagination and synthesizing information.

More…

Can AI match Human Creativity? *21.02.2020*

Creativity is a phenomenon whereby something new and somehow valuable is formed. The created item may be intangible (such as an idea, a scientific theory or a musical composition) or a physical object (such as a robot or a painting). Most of the things we use every day are inventions that no single human being could ever design within her lifetime. Rather than the product of individual innovators, these inventions can be thought of as the product of our societies. Ceding social authority to machines, we will be treating the achievements of mathematics as if they required no human understanding at all. We will be taking one of our highest forms of creativity and intelligence and reducing it to a single bit of information: yes or no.

More…

Machines Get Smarter, Evidence Grows They Learn Like Us *15.02.2019*

Back in 2017 Denis Hassabis of Alphabet's Deep Mind suggested intensifying the cooperation with Neuroscience to advance AI towards Artificial General Intelligence (AGI). Now, two years later, Artificial Neural Networks (ANNs) have made significant progress both in respect to diversity as well as quality. Humans have a powerful "physical intelligence" to infer physical properties of objects and predict future states in complex, dynamic scenes. This "abstract system of knowledge" is based on physics (for example forces or masses) and psychology (for example desires or beliefs). As new computational methods continue to be provided by research, intelligent machines are likely to match humans in learning, possibly within the next ten years.

More…

AI and the Future of Education *21.12.2018*

Progress in language translation provokes the question if it still makes sense to learn a foreign language. Taking this thought a step further, we must raise the question, if our educational institutions are ready of adjusting their learning concepts. Personalized learning provides the freedom to learn in one's own time and learning at one's own pace. Humanity has the unique chance to replace the inefficiency of hierarchical classroom learning with individualized concepts employing AI technology. Adolescence is the time to foster human values. By combining science and humanities as part of a new educational concept we set the stage to unlock the potential benefits of future AI-applications driven by the three C's: Curiosity, Consciousness and Creativity**.**

More….

Creativity is at the Core of Humanity; AI is just a Tool! *07.12.2018*

Homo sapiens first appeared some 100'000 years ago in Southern Africa. There is evidence that this species was of basically modern intelligence. However, Homo sapiens at that time was crucially lacking in creative imagination. About 40'000 years ago Creativity 'burst' onto the planet as can be observed from remarkable cave paintings or the invention of new stone-tools. There is no consensus among the research community why this happened so suddenly and much remains a mystery. Following the path of evolution, one can consider AI as a tool invented by humans, which can augment our lives both emotionally as well as logically. However, AI-machines have no intrinsic capability to sustain Creativity without incorporating human values and adherence to the laws of natural sciences.

More….

AI and Free Will, a Rising Concern *26.10.2018*

For centuries, philosophers and theologians have held the view that civilization, as we know it, depends on a widespread belief in free will. The growing impact of AI in our daily lives adds an additional dimension of concern to this ongoing discussion. Systems specifically designed to form relationships with a human will have much more power. AI will influence how we think, and how we treat others. Unfortunately, the commercial forces driving this technology are not always benevolent. Corporations at the forefront of AI drive the value of their shares by increasing traffic, consumption, and addiction to their technology.

More….

Will Quantum Physics Support Humans to Manage AI? *09.14. 2018*

AI has made rapid progress by leveraging enormous amounts of human expertise and data. However, for some problems this human knowledge may be too unreliable or simply unavailable. As a result, a long-standing ambition of AI is to create algorithms capable of achieving superhuman performance with no human input. Ever since the mathematician / physicist Sir Roger Penrose published his best-selling book "The Emperor's New Mind", there is an intense discussion going on about the effect quantum theory could have for AI. Penrose essentially believes that current day computers and hence AI can never reach the highest levels of human intelligence because human understanding is non-computational and hence exceeds the capabilities of machines.

More….

Will AI Achieve Human Consciousness? *04.05.2018*

The issue of artificial consciousness and the possible behaviour of conscious, intelligent machines will fuel the ongoing debate about the future of humanity. To achieve Artificial General Intelligence (AGI), consciousness has to be part of the equation.

If we want to move AI towards AGI, we will need our computers to become more like our brains. To crack the neural code of intelligence and consciousness, neuroscience research needs to uncover the functionality of a neuron's behaviour coupled to its synaptic network.

More…

Issues about the Rise of Emotionally Intelligent AI *09.03.2018*

Emotions are a key asset of humans. They provide the link between the body and the brain. Consequently, sensing emotions with AI provides access to a person's feelings and subsequently his mind. Sensing technology and emotion recognition software is continuously improving.

Besides its ability to track basic facial expressions for emotions such as sadness, happiness, anger, surprise, etc., emotion recognition software can also capture what experts call "micro-expressions" or subtle body language cues that may betray an individual's feelings without his/her knowledge.

More…

Has Homo sapiens reached the End of Life? *23.02.2018*

In his best-selling book 'Homo Deus', Professor Yuval Noah Harari makes the case that humans are close to facing an existential revolution. As we are in the process of decoupling intelligence from consciousness, collecting data in digital form across all facets of life, the economic value of humans will diminish. So far, we live with the conception that a high degree of consciousness is required to perform demanding tasks. In neuroscience, a great deal of effort has gone into investigating how the perceived world of conscious awareness is constructed inside the brain. While science is advancing AI, the value of consciousness needs to be reassessed. It is an integral of Homo sapiens.

More….

AI and the Mystery of the Human Brain *30.06.2017*

In the mid-1940s Alan Turing, John von Neumann and a few other brilliant people, drew up the basic blueprint of the computer age. A key feature of conventional computers is the physical separation of memory storage from logic information processing. The brain holds no such distinction. Although machine-learning techniques such as deep neural networks have recently made impressive gains, they are still far from providing human intelligence, modelling features like consciousness or creativity. Trying to create machine consciousness may turn out to be the way we finally begin to understand this most mysterious human attribute. Neuroscience 'software' in combination with neuromorphic systems 'hardware' could finally unlock the secret of human intelligence.

More….

Is AI changing Maslow's Pyramid of Needs? *05.05.2017*

Abraham Maslow's theory of human motivation, now over 80 years old, continues to have a strong influence on the world of business. The 'explosion' of science since the 1940's, largely fuelled by economic incentives, has resulted in an unprecedented expansion of scientific knowledge on an exponential trajectory. Humanistic psychology with its focus on self-actualization has taken a backseat. However, learning and experiencing both worlds -science and humanities - will set free the energy, joy and creativity needed to lead us towards a positive vision of life. Incorporating AI as a scientific tool to enhance our existence coupled with humanitarian self-awareness and mindfulness is likely to support this vision.

More….

Can Artificial Intelligence Replicate Human Consciousness? *24.03.2017*

The debate among neuroscientists, AI engineers and philosophers over one of the most ultimate of scientific questions - the nature of human consciousness - is gaining momentum. In response to many unanswered questions regarding the future of AI some of today's top techies and scientists like Stephen Hawking, Elon Musk, and Bill Gates express concerns over apocalyptic scenarios that are likely to arise as a result of machines with their own consciousness. Today our will provides the key to differentiate us from machines. However, we are also aware of the fact that humans are potentially 'corruptible', not just with money but also increased comfort reducing the effort to perform a task.

More…

Thoughts on Human Learning vs. Machine Learning *13.01.2017*

Both human as well as machine learning generate knowledge, one residing in the brain the other residing in the machine. This fact raises the question how we apply what kind of knowledge and how we balance these knowledge resources for optimal results. The application of so-called neural network software, mimicking functions of the human brain coupled with the availability of low-cost powerful computational hardware resources, provides opportunities to solve problems which so far have relied on human brainpower. With machine learning a new tool has emerged which is likely to raise our capacity to learn if applied in an ethically responsible way. The consequences are far- reaching as continuous brain research will advance machine learning over the years to come.

More…

Emotional Intelligence and the Aging Brain *14.09.2016*

In a corporate business context, as Singularity is coming closer, we can expect that Artificial Intelligence Machines (AIMs) will take over many of the cognitive intelligence tasks that are currently handled by humans. Consequently, the focus in managing human resources will eventually shift from cognitive driven business practices to emotional intelligence driven business practices. This for one will raise the potential value of aging leaders as their capacity for emotional intelligence grows and their relative loss of cognitive intelligence is compensated by the application of AIMs.

More…

Will My Smartphone ever have Consciousness? *05.07.2016*

From a scientific and technical point of view it seems possible that a smartphone might one day have some form of Consciousness. The decision to enable that is up to us. The century-old philosophical debate what Consciousness really is has recently become enriched by Neuroscience with its huge and well-funded efforts to understand the functioning of the human brain. Computational Neuroscience which is part of this effort is trying to model the brain and eventually provide input to Artificial Intelligence applications and new computer architectures thereby plotting the road towards Singularity and its Ecosystem.

More…

2.3 Machine Intelligence Research (AI)

GPT-4: A first step towards Artificial Superintelligence? *17.11.2023*

Artificial superintelligence is defined as any intellect that greatly exceeds the cognitive performance of humans in virtually all domains of interest. Based on experiments with an early version of GPT-4, Microsoft researchers conclude that it could reasonably be viewed as an early, yet still incomplete version of Artificial General Intelligence (AGI). Considered to be the prerequisite to Artificial Superintelligence, some Google researchers predict that we have a 50% chance that AGI will be achieved in this decade.

We have no way of knowing what Artificial Superintelligence will do or how we can control it. There is no 'on-off' switch. Hence, strong regulatory controls are necessary to avoid a potential disaster.

More…

AI-Hallucination Problems: The Human Connection *03.11.2023*

AI-Hallucination is a phenomenon whereby a large language model (LLM) perceives patterns to create outputs that are nonsensical or altogether inaccurate. The term is paradoxical, given that hallucinations are typically associated with humans. They can occur with our eyes such as seeing unreal or bizarre movements or hearing faint noises or voices. The output of AI-machines manipulates the users' perception and might be more aptly considered a mirage rather than a machine that is hallucinating. To detect an AI-Hallucination one needs to fact-check the AI-model's output. To many researchers AI-Hallucinations represent a growing problem which needs correction before an overhyped bubble bursts.

More…

From Illusion to Reality: AI-Alignment with New Insights? *28.07.2023*

According to cognitive scientist Donald Hoffman, human perception of reality is an illusion, and the real world is nothing like the one we experience through our senses. Theories from physics, philosophy and neuroscience shape our perception of reality. New AI-models such as ChatGPT or GPT-4 map reality based on the user's prompts. However, this perception could also be an illusion, fostering the view that there is no objective reality. These new AI-models are either totally overhyped or they provide a new experience of reality. Darwin's two-hundred-year-old evolutionary theory about the 'Survival of the Fittest' is likely to remain the reflection point for reality. And this indeed is not an illusion.

More…

From ChatGPT to Enhanced Search and Beyond *24.02.2023*

Search-enhanced transformer models are likely to replace ChatGPT. The tech-giants position this new service as 'Co-Pilot' or 'Electric Bike of our Minds'. Positioning this new search capability as assistant to the mind, raises the question how the mind is defined. The mind of today's AI is very different from ours and there is plenty of room for improvement. Thousands of researchers are engaged in Neuroscience - adding new theories daily how to crack the human brain's neural code. One can conclude that advancing the capabilities of search- based mind-tools will sooner or later introduce brain research as a driver of product development, setting a new benchmark for successful AI-adaptation.

More…

With Curiosity Towards a New AI: The Issue of Learning *26.08.2022*

Animals and humans exhibit learning abilities and understandings of the world that are far beyond the capabilities of current AI and machine learning (ML) systems. How is it possible for an adolescent to learn to drive a car in about 20 hours of practice and for children to learn language with what amounts to a small exposure. For many years now Artificial General Intelligence (AGI) has been the holy grail of AI-research Since years with little or no progress for overcoming problems related to causality. Based on a new approach of self-learning systems, with curiosity and common sense as driver, we might finally achieve an AI that serves humans as opposed to humans serving AI-machines.

More…

Do Nanobots signal the Arrival of Singularity ? *08.04.2022*

John von Neumann is regarded as one of the most intelligent and talented individuals. He defined singularity as the technological creation of super intelligence, arguing that it is difficult or impossible to predict what human beings' lives would be like in a post-singularity world. In 2019, a highly profiled group of researchers predicted that advances in neural nanorobotics will create a 'Superbrain' that can harness the thinking power of any number of humans and machines in real time through a 'human-brain-cloud' interface. Totalitarian regimes in China and increasingly so in Russia, might well be tempted to misuse the power of nanotechnology as a means of mind-control, both in a military and socio-economic context.

More…

A Paradigm Shift in AI and the Future of Content Production *27.08.2021*

Due to their inherent capacity to correlate the entire internet content , transformer-based models like GPT-3 will radically change how AI systems will be built. With transformer-technology new applications will emerge that go way beyond its current capacity of processing text. Creating high-value content engages humans that are knowledgeable in the technical domain of intelligent machines as well as humans knowledgeable in the domain of psychological behaviour. This 'co-creative' effort has the potential of driving humanity to the next higher level of evolution while humans will continue in contributing their key asset: creativity and emotionality. The roadblocks of getting there, however, are huge.

More…

Realigning AI Research to Achieve AGI *12.02.2021*

To understand the complexity of achieving AGI it is worthwhile looking at some of the capabilities that AGI will need to master such as sensory perception, natural language understanding, creativity, and social and emotional engagement. Brain processes underly not only simple motoric behaviours such as walking and eating but also complex cognitive acts and behaviour that we regard as basically human: thinking, speaking and creating works of art. The focus of AGI research is to integrate expertise in Neuroscience with expertise in Neuropsychology and Neuroinformatics. With these disciplines combined, problem-solving will be applicable to a wider spectrum than available with Narrow-AI.

More…

Quantum: from Physics to Biology. What about AI? *15.01.2021*

Quantum mechanics provides the calculation of probabilities of how physical systems can behave. It is typically applied in defining the behaviour of molecules, atoms and sub-atomic particles. Unlike conventional computers, which have bits that can exist in either state of 0 or 1, with quantum computers the quantum bit (or qubit for short) can exist in additional states. It can exist as a discrete state (0 or 1) or as a superposition of both states, adding a third dimension for the processing of data. Quantum states correspond to probabilities rather than to absolute values. This fact also implies that human analysis and interpretation is still required in problem-solving. The complexity of problems we can solve far exceeds what conventional AI is capable of handling today. The future is Quantum-AI.

More…

Will AI overcome the Limits of Science? *18.12.2020*

The utility of science is knowledge of natural physical mechanisms and the generation of technology. Efforts to understand complex systems, especially our brain, might well be the first barrier demonstrating the limits of science. Albert Einstein argued that quantum theory was an incomplete description of the universe and that there must be hidden variables that we do not yet understand. Our cognitive and reasoning capabilities are too limited in dealing with this situation. Hence above human-level AI might well hold the key to unlocking the limits of science, opening a new scenario of knowledge generation.

More…

Are we Heading towards the Next AI-Winter? *25.09.2020*

While the mutual relevance of humanities, social sciences and neuroscience has increased significantly, the complexity to analyse brain functionality with current AI technology has reached limits. Expanding AI with new insights from neuroscience is required to overcome these barriers.

Abstract concepts like creativity, social cognition, and free will are necessary components of any conscious being but have proven to be extremely difficult to formalize. Keeping human thought and its relationship to individual non-computational experiences alive, human-level AI will remain and support us as a building block for the exploration of new frontiers. Hence a third AI-winter is highly unlikely to occur.

More…

AI generated Language: What about Humans? *19.06.2020*

Language is one of the most important means of communication and elemental for the existence of modern societies, institutions, states and cultures. AI-based Natural Language Generation (NLG) is the process of producing meaningful phrases and sentences in the form of natural language. NLG generates narratives that describe, summarize or explain structured data, making the writing of data-driven financial reports, product descriptions, or meeting memos more efficient. In the context of language and writing, we must distinguish between computer-generated textual representations of facts and the creative process of formulating an idea or a story, something we might also refer to as ‘thoughtful writing’.

More…

AI and the Challenges ahead, a Critical Assessment *27.12.2019*

While educational institutions are overwhelmed by an onslaught of new students reaching for a degree in machine-learning, there is growing concern among members of the AI community that machine-learning and deep neural networks (DNNs) are flawed with severe problems.
Most advances in the field are associated with creating bigger neural networks and training them with more and more data. Excitement has blinded research to one of the fundamental problems that AI technology still suffers from: CAUSALITY. DNN algorithms are powerful, but to think that they 'think and learn' in the same way as humans do is incorrect.
More…

Can we Grade AI and Compare it with Human Intelligence? *13.12.2019*

With the resurgence of AI in the late nineties, applying Deep Learning to solve specific cognitive problems, stipulates the question what constitutes intelligence? How can one create intelligence artificially if we have no precise definition of what intelligence is?
Applying a framework like Francois Chollet's Abstraction and Reasoning Corpus (ARC) is likely to empower AI research with a new perspective on defining and evaluating intelligence. Measuring AI performance against human intelligence will eventually advance AI to the point where artificial cognitive intelligence will become a commodity, providing intelligence as a service to everyone.
More…

AI and the Issue of Human Emotions *18.10.2019*

One of the founding fathers of AI, Marvin Minsky was once questioned about machine emotions and said: "The question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions".
We have reached the point where computational methods can be applied to process the expression of emotions that occur with human interaction. However, this does not imply that intelligent machines have emotions. For artificial intelligence to have human emotions, we would not only have to recreate the human brain but also its senses, body and consciousness.
More...

Is Alphabet's DeepMind Subsidiary on the Right Track? *06.09.2019*

DeepMind, the world's largest research-focused artificial intelligence operation, is losing money fast. The rising magnitude of DeepMind's losses is impressive, more than USD 1 billion in the past three years, mostly related to its ongoing hiring of top researchers worldwide at very high salary levels with a current headcount of over 850 employees. Advances in deep reinforcement learning have fuelled DeepMind's impressive victories in Go and the computer game StarCraft. However, this has hardly advanced DeepMind's declared goal of being the world-leader in Artificial General Intelligence (AGI).

Today AI-research covers Neuroinformatics, Neurobiology and Neurophilosophy. Is DeepMind on the right track?
More…

Is Artificial General Intelligence (AGI) a Myth? *23.08.2019*

Artificial General Intelligence (AGI) can be defined as the ability of a machine to perform any task that a human can. Although existing applications highlight the ability of AI to perform tasks with greater efficiency than humans, they are not generally intelligent. Many researchers believe that AGI will be reached sometime this century, others consider AGI to be a myth. Reflecting on theory of mind provides one way of testing AGI's viability. Without some sort of radical breakthrough in design, sentient machines that can comprehend and communicate empathy and emotions will remain science fiction. Life is analogue not digital. The idea that digital intelligence can reach biological intelligence is likely to remain a myth.

More…

The Evolution of AI from 2018 to 2019 and Beyond *04.01.2019*

The raising complexity of deep-learning algorithms and networks is beginning to backfire as a lack of transparency generates distrust and concern regarding the ethical implications of possible errors in the results computed. Next to the regulatory and ethical issues which will continue to be discussed well into 2019 and beyond, we are likely to witness two efforts to restore trust: Provide secure communication based on quantum-internet to protect private and corporate data with secure access for anyone across the entire globe and to move from a technology-driven AI to a human centric AI, where AI augments humans to reap the potential benefits of AI while adhering to ethical standards as part of the application.

More…

Can AI Match Humans in Common-Sense Reasoning? *17.08.2018*

Common-sense reasoning (CSR) is a major stepping-stone in reaching Artificial General Intelligence (AGI). Many experts from the AI-community, like Geoffrey Hinton, considered the 'grandfather' of neural networks, or Demis Hassabis from Google DeepMind agree, that we need new concepts that go beyond Deep Learning and back-propagation. At a glance, humans can perceive whether a stack of dishes will topple, a branch will support a child's weight … or if a tool is firmly attached to a table or free to be lifted. Such rapid physical inferences are central to how people interact with the world and with each other, yet their computational underpinnings are poorly understood.

More…

Can AI Match Humans to Ask Questions? *03.08.2018*

Asking questions has always played a role in leadership, but it's more vital than ever in today's fast-changing digital landscape, says Hal Gregersen, the executive director of the MIT Leadership Centre and lecturer at MIT Sloan School of Management. Consequently, the drive to provide business leaders with conversational AI systems to add support to their decision making is gaining momentum. Microsoft has become a major driving force in conversational AI. Forming the 'Microsoft AI & Research Group', bringing together more than 5,000 computer scientists and engineers to focus on the companies AI products and services, underlines the intensity of this strategic shift to develop machines that can think, reason and communicate like humans.

More…

Thoughts on Human Learning vs. Machine Learning *01.06.2018*

Both human as well as machine learning generate knowledge, one residing in the brain the other residing in the machine. This fact raises the question how we apply what kind of knowledge and how we balance these knowledge resources for optimal results. The application of so-called neural network software, mimicking functions of the human brain, coupled with the availability of low-cost powerful computational hardware resources, provides opportunities to solve problems which in the past have relied on human brainpower. With machine learning a new tool has emerged which is likely to raise our capacity to learn if applied in an ethically responsible way. The consequences are far- reaching as continuous brain research will advance machine learning over the years to come.

More…

Is AI capable of producing Art? *18.05.2018*

According to Wikipedia, art is defined as the expression or application of human creative skill and imagination, producing works to be appreciated primarily for their beauty or emotional power. In June 2016, Google launched the Magenta project, which directly addresses the question, “Can machines be creative?" Researchers at Rutgers University’s Art and Artificial Intelligence Laboratory recently generated entirely new artworks, using a new computational system that plays the role of an artist, attempting to demonstrate creativity without any need for a human mind.

More…

AI in Search for new Inspirations and Human Contribution *01.12.2017*

Continuous progress in artificial intelligence (AI) is raising expectations to build systems that learn and think like people. Many advances have come from using deep neural networks trained in tasks such as object recognition, language translation or board games. Despite their biological inspiration and performance achievements, these systems differ from human intelligence in crucial ways. One source of inspiration to advance AI to a level closer to human thinking comes from Geoffrey Hinton, Professor at the University of Toronto and a Google researcher. Another comes from Joshua Tenenbaum, Professor at MIT’s Department of Brain and Cognitive Sciences, engaged in reverse engineering the human mind.

More….

What happens when Artificial equals Human Intelligence? *03.11.2017*

Very much driven by ongoing progress in neuroscience to crack the neural code of intelligence, most scientists seem to agree that this moment of intelligence-equality also referred to as ‘Singularity’ will happen within the next 15 to 65 years. What is the fate of humanity after this milestone is reached? Before we try to answer this question, we should keep in mind that intelligence is only part of what human existence is all about. To deal with the widespread fear that the potential of AI can be misused by governments to rage war or the concern that market-controlling institutions misuse their data-analysis power, we have to widen our scope.

More….

From Digital Transformation to AGI: are we really ready? *28.07.2017*

Currently, most AI systems are based on layers of mathematics that are only loosely inspired by the way the human brain works. Different types of machine learning, such as speech recognition or identifying objects in an image, require different mathematical structures, and the resulting algorithms are only able to perform very specific tasks. In a paper published in the journal Neuron, Demis Hassabis, CEO of Google's DeepMind subsidiary and three co-authors argue that only by better understanding human intelligence can we hope to push the boundaries of what artificial intellects can achieve. A general intelligence will need more human-like characteristics—such as an intuitive understanding of the real world and more efficient ways of learning.

More…

Singularity: From AI to Augmented Intelligence *14.07.2017*

As artificial intelligence (AI) gains momentum exponentially, we are heading towards a point where 2 scenarios seem possible: one is the science fiction scenario where humans will eventually be dominated by super intelligent machines, the other is the augmented intelligence scenario where humans succeed in employing intelligent machines to their own advantage, reaching a new level of humanity. There is a wide concern that singularity will result in massive job losses across many industry and business segments. New socio-economic models might be required with features such as 'guaranteed income' or 're-education bonus' to provide support during the transition towards singularity. Once the transition from AI to augmented intelligence is accomplished, our creativity will define new jobs and services which currently do not exist.

More….

Superintelligence has arrived and now what? *02.06.2017*

'Superintelligence: Paths, Dangers, Strategies' is a 2014 bestselling book by the Swedish philosopher Nick Bostrom from the University of Oxford. He argues that if machine brains surpass human brains in general intelligence, then this new superintelligence could replace humans as the dominant lifeform on earth. In a series of interviews with 95 researchers conducted by Nick Bostrom's team and partners, 50% of all respondents declared that in their opinion superintelligence would arrive starting 2040. Google researchers have shown that their learning algorithms can automate the job of designing machine-learning software with designs that rivals or beats the best work of human machine-learning experts. Superintelligence has arrived as an answer to resolve the problem of human resource shortage in the generation of machine learning software.

More…

Chapter 3

3.1 Business

The GPT-4 Turmoil: What about the Need for Talent? *05.05.2023*

With GPT-4 now available, much has been speculated as to what the rapid progress of transformer-based generative AI means for the future of work. This new technology is not just disrupting the community of knowledge workers. The wake-up call for roughly 150'000 engineers being fired disorients and upsets many that work for Big-Techs like Google.

The rapid advancement of technology is driving us towards a knowledge economy where skills become equivalent to currency, forcing corporations to adapt. The boundary between humans and intelligent machines becomes increasingly blurred. To solve specific problems requires a cooperative mindset between business management and AI-experts.

More…

The Future of ChatGPT: Separate Language from Thought *10.03.2023*

Experiences suggest that language and thought are two distinct entities which need to be considered if we discuss the future potential of ChatGPT. To understand the power and limits of Large Language Models (LLMs), we must separate 'formal' from 'functional' linguistics. With language we learn to understand, using words and grammar. Whereas deep learning has enabled major advances in computer vision, today's AI-systems are far away from developing human-like sensory-perception capabilities.

Multimodal perception, or knowledge acquisition and 'grounding' in the real world, is needed to move beyond ChatGPT-like capabilities and achieve Artificial General Intelligence (AGI).

More…

From Google Search to Open AI's ChatGPT and Beyond *16.12.2022*

OpenAI just announced ChatGPT. Responding to text prompts from users, ChatGPT can be asked to write essays, lyrics for songs, stories, marketing pitches, scripts, complaint letters and even poetry.

Paul Buchheit, the creator of Gmail is convinced that the search engine result page, which is where Google makes most of its money, will be disrupted by ChatGPT within 2 years. In contrast to Google Search, ChatGPT interactively answers questions about its results and the user gets a reply in the context of the question raised. The danger is that results from ChatGPT can be false. Hence, users need to develop filters to reduce misinformation within their field of expertise.

More…

The Metaverse: Big Business or Just Another AI-Hype? *01.07.2022*

The Metaverse, proposed by Meta (formerly Facebook), is still under construction - its main building block is AI. Microsoft, as competitor, positions the Metaverse as a 'digital space inhabited by digital representations of people and things.' To some critics the Metaverse looks alarmingly like productivity software kitted out with VR glitter. The real threat comes from Zuckerberg's 'Suckerverse'. The lack of experiencing so called 'embodiment' defines one of the limits of the Metaverse and its often-overhyped expectations. It is difficult to predict where the Metaverse will be in five years and if we are indeed witnessing a paradigm shift towards the next industrial revolution.

More…

Decision-Making, Perception and Illusion: What about AI? *17.06.2022*

Perception is not supposed to be an accurate representation of sensory information. Rather, it is supposed to be an interpretation. The mental experience of perceiving is filtered by our senses before our biological neurons and its synaptic connections within the brain will react. An illusion is a distortion of the senses and an indicator as to how the mind normally organizes and interprets sensory stimulation. Higher level decisions require a broad understanding of issues which go beyond the capacity of current AI-technologies. Hence, human judgement and sound assessment of technological progress are likely to remain the key to successful decision-making for a long time to come.

More…

Unlock the AI-Value Contribution with Small Data and Tools *06.05.2022*

According to a recent press release, Gartner says that 70% of organizations will shift their focus from Big Data to Small and Wide Data, providing more context for analytics and making AI less data hungry. The more data one has, the more likely the chance that the AI-model does not understand its context or causality. Hence, it comes as no surprise that the scenario of 'bigger is better' is coming under scrutiny while 'small is beautiful' gains traction.

With every big data set used in large AI-projects, a thousand small data sets may go unused. By adding a tool-strategy, the human factor within the man-machine relationship for solving problems will enhance creativity and innovation as humans have more time to think and reflect how to create value.

More…

Launching LAC²: AI's Value to 'Think Global and Act Local' *22.04.2022*

About two years ago, a couple of AI-enthusiasts got together, starting a discussion how to promote Central Switzerland as an attractive local AI-Hub. A principal feature of innovative regions is their capacity to create environments favourable to turning knowledge into new products and services, supported by a collaborative platform where AI-Experiences can be openly discussed.

Management teams are under pressure as their traditional corporate culture gets disrupted by a new form of collaborative and interdisciplinary leadership.

Hence, organisations as well as individuals are challenged to constantly 'reinvent' themselves, The mission of LAC² is to support its members on this endeavour. Hence, become engaged and join LAC²!

More…

From 'Noise' to better Decision-Making *14.01.2022*

'Noise: A Flaw in Human Judgement', co-authored by Nobel Laureate Daniel Kahneman, explores why people make bad judgments in making decisions and how to make better ones. To improve decision-making, one should consider the application of intelligent systems, or as Daniel Kahneman puts it: 'Clearly AI Is Going To Win'.

The winners will be those that are able to implement new hybrid cloud-edge IT-infrastructures efficiently. Also dubbed as 'Internet of Things (IoT)', this new wave of disruptive technology will be as significant as the drivers of the current industrial revolution, reducing the high cost and negative long-term consequences associated with wrong decisions.

More…

Neurophilosophy and AI-inspired Leadership *24.09.2021*

Augmenting science with philosophy has opened-up complimentary paths of thought, enhancing the discussion as to how AI can reach human-level intelligence scientifically as well as philosophically.
When Patricia Churchland, coined the term 'Neurophilosophy' for the first time, few philosophers thought that neuroscience and philosophy had much to say to each other. The mindset of experimentation, taking advantage of AI-tools, will likely make the difference if an organization survives. While this stipulates an awareness of philosophical thought, the question looms as to how we acquire and implement such a mindset, supported by the suggested thought model.

More…

Quantum Mechanics: the Next Challenge beyond AI? *18.06.2021*

One fundamental different mindset between quantum mechanics and classical mechanics can be defined as follows: Quantum mechanics describes the dynamics of ideas, whereas classical mechanics describes the dynamics of machines. In a business context quantum management implicates the integration of serial and associative thinking in analogy to quantum processes like entanglement. A first step is to understand quantum's potential for an organization's product and service offering and to review the management processes required for a mind-shift towards quantum management in response to the limits experienced with AI-focused applications.

More…

Corporate Culture and AI: Are you Ready? *07.05.2021*

While Digital-Transformation is setting the stage for moving on to AI-Transformation it appears that many corporations are struggling in realizing its potential benefits. To master the increasing complexity produced by advances in AI-research and its impact on AI-Transformation demands a corporate culture that supports these changes at all levels. Collaboration is the key in mastering the raising complexity of science and technology. Most importantly collaboration is a prerequisite for collective intelligence, the Nr.1 success factor in mastering corporate complexity and likely the future benchmark for 'survival-of-the-fittest'.

More…

Thinking, Fast and Slow: What about AI? *26.03.2021*

According to Kahneman's theory, human decisions are supported by two different kinds of mental abilities: a thinking pattern ('system 1') providing tools for intuitive and often unconscious decisions and a second pattern ('system 2') handling more complex situations. Viewed by Neuroscience, an emotional response in decision-making triggers the question how the brain can coordinate the fast thinking of Kahneman's system 1 with the slow thinking of system 2? A hybrid AI-system, combining ML with Symbolic AI, offers an intriguing possibility to draw a parallel between the mental mindsets represented by Kahneman's system 1 and system 2. This implies that future AI-system could be based on a hybrid multi-agent architecture where an individual agent focuses on specific skills.

More…

Dealing with Complexity? Try Collective Intelligence & AI *29.01.2021*

Generating ideas through discussions with employees, customers and other external parties represents one way in which collective intelligence is commonly used. Collecting ideas and feedback from a greater number of diverse individuals generates large data sets for training artificial neural networks. The combination of collective internet-connectivity with knowledge will introduce new IT-platforms supporting AI-focused value generation. Facing increasing complexity, AI-empowered human resource management will be key. The capacity of building and managing teams with diverse competencies and distinct behavioural profiles to optimize man-machine interactions will define a new competitive landscape for the 'survival of the fittest'.

More…

Collective Intelligence for Regional Business Development *23.10.2020*

The major challenge for building collective intelligence is to combine knowledge from different sources and to customize this information for the specific needs of individual users and local organisations. Two types of assets are of increasing importance: data and people. Adding AI to the equation sets the stage for merging human and machine intelligence, taking advantage of the assets that both bring to the table. A principal feature of innovative regions is their capacity to create environments favourable to turning knowledge into new products and services. An AI-Collaboration Platform is the prerequisite for forming and supporting regional intelligence with modules covering the entire innovation process.

More…

From Collaboration to Collective AI *14.08.2020*

Humans' ability to collaborate for reaching otherwise inaccessible goals may be one main cause for our success as a species. Collective intelligence emerges when these contributions are combined to become more than the sum of their parts. As the individual intellectual capacity of humans is limited vis-à-vis an accelerating increase in scientific and technological complexity, the application of collective intelligence augmented by AI, dubbed CAI, is a major driver for future value generation. As AI is maturing and eventually turning cognitive intelligence into a commodity, integrating human assets such as curiosity, creativity and moral judgement are a must to realize the value that can be generated with CAI-platforms.

More…

Ecosystems: From Nature to Business to Human-Level AI *22.05.2020*

The term 'Ecosystem' was first used in 1935 in a publication by the British ecologist Sir Arthur Tansley. He devised the concept of an ecosystem to draw attention to the importance of the transfer of materials between organisms and their environment. Starting in the early 1990s, James F. Moore introduced the strategic planning concept of a business ecosystem.

He defined the 'business ecosystem' as a community supported by a foundation of interacting organizations and individuals. With advancements in science and technology, new business ecosystems will evolve. We need a dual-ecosystem strategy: a) for caretaking of nature to support our intrinsic mind-body requirements and b) for building-up AI enhanced individuals and organizations to establish economic sustainability.

More…

Could AI-Hype cause another Nasdaq Crash? *15.11.2019*

The dot.com crash starting in the year 2000 was the result of greed and unrealistic profit expectations. Recovering from the losses, private equity investment in AI has accelerated. It is estimated that more than USD 50 billion was invested in AI start-ups during the period 2011 through to mid-2018.
However, in 2019 growth has come to a halt. Are we overpromising and underdelivering on what AI is capable of? If the downturn in AI investments continuous, we might experience a crash in late 2020 or early 2021 as venture capital's expectations are more and more confronted with the limitations of 'Narrow AI', such as the handling of common sense or the interpretation and understanding of content.
More…

The accelerating Impact of AI on Research *01.11.2019*

Digital transformation, also dubbed as Industry 4.0, is in full swing. AI transformation, however, is just at the beginning, raising many societal and individual issues such as the replacement of human researchers with intelligent machines. Many scientists are arguing that the latest techniques in machine learning and AI represent a fundamentally new way of doing scientific research. One such approach, known as generative modelling, can help identify the most plausible theory among competing explanations for observational data, based solely on the data without any preprogramed knowledge of what physical processes might be at work in the system under study.
More…

AI and Corporate Leadership in 2025 *24.05.2019*

By 2025 corporate knowledge-silos will no longer exist. Modelling corporate activities with a digital 'sandbox' enables rapid prototyping for testing new business models and business opportunities.
Adding AI common-sense reasoning to information that defines a corporation's identity and values, gives corporate leaders the opportunity to reflect on future strategies or invoke decision-making with a much higher level of confidence.
Just as emotional intelligence became a leadership-asset about ten years ago, we now see a rising need for leaders to apply and support collective intelligence with an appreciation of interdisciplinary thinking.
More…

AI and decision-making, what about intuition? *10.05.2019*

Many consider the division between analytic and intuitive thinking as opposites. However, a 2015 meta-analysis – an investigation where the impact of a group of studies is measured – has shown that analytic and intuitive thinking are typically not correlated and could happen at the same time. Infants learn through interacting with the real world, which appears to be training various intuitive engines or simulators inside the brain without the need for massive training data. We need a much better understanding of humans, both in respect to intelligence as well as intuition. This clearly stipulates that neuroscience and behavioural science are required to advance AI further.
More…

Does your Company need a Chief Philosophy Officer (CPO)? *18.01.2019*

Philosophy can help to provide purpose and guidance by tackling fundamental questions about the meaning of life. Artificial intelligence has close connections with philosophy because both share several concepts such as intelligence, consciousness, epistemology, and even free will. The idea behind having a CPO is that the position could be helpful in a business environment that is accelerating at an unprecedented speed. The main-responsibility of a CPO is to provide support for interfacing human values and skills with intelligent machines in order to optimize the potential of man-machine augmentation. To reach this goal he must motivate the team-members to ask questions that are outside of the 'corporate box'.

More….

Thoughts about a Brain inspired Organization (BiO) *06.10.2017*

While current machine-learning efforts are mainly focused on extracting knowledge from 'big-data', the next stage of Artificial General Intelligence (AGI) will provide systems with learning and decision-making capabilities equivalent to those of a human. Consequently, we have the opportunity to create an intelligent organization, modelled on the architecture of the human brain in short, a thought model of a Brain inspired Organization (BiO). Decision-making is one of the fundamental tasks of any organization. Thanks to its continuous, unlimited learning capacity for knowledge generation applying AGI technology, a BiO is far more capable to adapt to change compared to a conventional organization.

More….

AI+IoT+Neuroscience = the Intelligent Organization *11.08.2017*

Dear Reader,

In its second year of operation the website starts with an Essay that opens a new chapter regarding the emergence of Singularity. The integration of AI, IoT and Neuroscience provides new and exciting scenarios to implement intelligent organizations managed by humans. To reach this point, however, humans have to develop their personality to stay on top of these challenging tasks and to establish a human-machine interaction that keeps humans in control.

More…

Machine Learning and Corporate Leadership *27.01.2017*

Leadership is strongly linked to a corporate culture which defines values far beyond the typical elements of balance sheet data such as earnings, growth and profitability. The Start-Up represents a culture where mostly young people combine all their energy and knowledge to realize a 'dream' producing something which customers find useful. An established company has customers, products and services acquired over many years. One of their greatest assets is the 'Data' related to these activities. To extract knowledge from this data is accomplished through advancements in Machine Learning. As paradox as this may sound this trend will have the effect that human resources are likely to become the most valuable asset a company has. Thus, human resource management will be a key leadership issue.

More….

Decision Making: performed by Humans or Machines? *02.12.2016*

Over the last 40 years several thought models have been created to describe how humans make decisions. Common to most of them is the view that humans do not just follow rationality to make decisions. Behavioural economics sometimes also referred to as Neuro Economics uses psychological experimentation to develop theories about human decision making and has identified a range of biases as a result of the way people think and feel. One of the most important conversations in the field of Machine Learning is the debate surrounding the use of predictive methods to influence human decisions. Machine Learning methods could hypothetically make decisions for humans, but should they? And where should we draw the line?

More…

Economic Forum 'The Rise of the Machines' *11.11.2016*

On November 7, 2016, the UBS International Centre of Economics in Society conducted its 5th Forum for Economic Dialogue titled 'The Rise of the Machines'. Over 500 people attended this years' forum at the Kaufleuten in Zurich. The UBS International Centre of Economics in Society is an Associated Institute at the Department of Economics of the University of Zurich. It was established in 2012, enabled by a generous founding donation by UBS of CHF 100 Million. This year's Forum featured economists, entrepreneurs, philosophers, and technology experts who discussed whether, and if so how, the wave of technological change will revolutionize the way our economy operates and how human beings participate in it.

More…

Machine Learning and the 4th Industrial Revolution *14.10.2016*

Every generation or so, a number of emerging technologies converge, and something revolutionary occurs. The reason we are now experiencing a paradigm shift towards the 4th industrial revolution, largely driven by AI and Machine Learning, is the simultaneous occurrence of the following: a) The growing availability of massive computational resources for neural network and machine learning applications b) Networked access to the massive and rapidly growing data pools (big data) representing knowledge mostly as unformatted data c) The ongoing Integration of Deep Learning (a subset of machine learning) and Neuroscience with brain research.

More….

From Digital Transformation to Singularity *10.08.2016*

Digital Transformation is the prelude to Singularity. A digitally transformed company has the corporate culture to successfully manage the complex issues of Singularity. The following discussion will help to understand the drivers behind this paradigm shift. Preparing for a digital economy is no easy task. It means developing digital capabilities in which a company's activities, people, culture, and structure are in sync and aligned toward a set of organizational goals. Cognitive Singularity will not happen suddenly as a 'big bang'. It will come step by step as deep learning AI and cognitive computer applications are generating value for specific business and customer segments.

More….

Singularity will cause job market disruptions! *15.07.2016*

Technological advances have destroyed jobs since the beginning of industrialization. However, new job opportunities requiring new skills are often created following layoff-periods. The time for adjustment and the flexibility of individuals to adapt to new job situations supported by a socially responsible leadership is the key to handle the impact of change. With Singularity approaching there will be no more than a few outstanding high-paid individuals who are the ultimate drivers of advancing the performance of AI systems at an exponential rate. On the other side, there are a vast number of people facing potential unemployment due to the consequences of this development. This will cause serious disruptions especially within the white-collar job market.

More….

Artificial Intelligence and the VW Emissions Disaster *14.06.2016*

The VW diesel emissions disaster will go down in history as one of the most significant commercial disasters with billions of dollars lost in the value of share capital and damage to VW's reputation which will be extremely costly and time-consuming to repair. Engineers had the idea that artificial intelligence software could be implemented that would sense if the car were being government tested for exhaust emission. Under normal driving conditions, however, this 'artificial intelligent switch' would not be activated causing far higher emissions. Additional laws will be put into place to avoid a reoccurrence of the VW case. However, unless a corporate culture of ethical conduct is implemented, also applied to the design of AI software, laws will be broken again.

More…

3.2 Society

Will AI Cause Burnout as Result of Economic Growth? *20.10.2023*

Burnout can affect anyone, from stressed-out career-driven people to overworked employees. There are three symptoms that are signs of burnout: exhaustion, frustration and lack of concentration. Since ChatGPT was launched in November 2022, research shows that generative AI leads to productivity spikes and increased job satisfaction. However, burnout has also become a widespread symptom of individuals involved in the design of AI systems.

Some companies are tackling the problem by introducing tools that provide alerts, nudges and data-driven insights to help workers avoid technology fatigue and not to fall into the 'burnout-trap'.

More…

Thought Cloning: A new Model to Advance AI? *14.07.2023*

Behavioural cloning consists of deep-learning algorithms whereby existing audio-, photo- and video-records can be manipulated to create 'Deepfakes'. For AI systems to think like humans, researchers propose a new approach called 'Thought Cloning' where users narrate their thoughts watching YouTube videos, for example. It is unlikely that individuals would be willing to support monetization of their thoughts. Yet capturing users' thoughts with non-intrusive brain sensors - might indeed signal a new approach to AI-computing.

However, from an ethical point-of-view, this new technology should never be permitted to enter the market without strict government controls.

More…

From Google-Search to GPT4: The Capturing our Emotions *06.04.2023*

According to Marvin Minsky, one of the founders of AI, the question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions.

Emotion and perception are closely related. The convergence of language, multimodal perception and world modelling is considered a prerequisite for achieving Artificial General Intelligence (AGI).

New sensors that capture our emotions while we interact with transformer-based systems like GPT4, signal a paradigm-shift in the application of AI.

With the excitement and fear surrounding these large language models, we need to know what this technology can and cannot do and what risks it poses.

More…

If Superintelligence has arrived, what about Science Fiction? *13.01.2023*

In his 2014 book 'Superintelligence: Paths, Dangers, Strategies' Nick Bostrom used scientific arguments to prove that machine intelligence will eventually surpass the general intelligence of humans and that superintelligence could replace humanity. In contrast, science fiction author George Orwell who published '1984' seventy years ago, foresaw that mass surveillance, fake news, designer babies and the use of antidepressants will become today's reality.

Yet, the interaction between science and science fiction has not produced the apocalyptic scenarios predicted by science fiction. It seems that this interaction benefits scientific and technological progress if governments maintain the necessary regulatory and ethical controls.

More…

Social Media: Why We Should Better Understand Its Impact *02.12.2022*

Social media shapes our relationships, our behaviour, our work and our brains. Algorithms are specifically designed to influence users in their decision-making. Corporations selling products and services use social media for building customer loyalty and trust. Studies show that this ability to capture your attention has an adverse effect on your brain. Heavy social media users perform worse on cognitive tests, especially those that examine their attention and ability to multitask.

Today's teens are challenged to find a human-centric way to incorporate social media into their every-day life against the odds of being manipulated. When today's teens become adults, we should know if this merger of machines and humans was successful.

More…

The Influencer Economy and the Issue of 'True' Reality *07.10.2022*

An influencer is a content creator with a commercial intent who tries to build trust and authenticity-based relationships through social media platforms. As the Metaverse intensifies consumer engagement, the influencer-based economy gains momentum. At the EU level, no specific legislation to regulate influencer marketing is yet in place.

Late 2021, following Facebook's rebranding to Meta, Microsoft positioned the Metaverse as "a digital space inhabited by digital representations of people and things", creating a new artificial reality experience. Some researchers conclude that a 'true' reality discussion related to the Metaverse is pointless because we live in a simulation already.

More…

The Ukrainian Conflict: Aggression and Counteraction *11.03.2022*

The Ukrainian armed conflict and its violation of fundamental international law is causing a human tragedy Europe has not witnessed since World War Two. It is also obvious that western democratic states and their leaders have failed to recognize Putin's deception of his growing aggressiveness.

In 1939 John Dollard, a professor at the University of Washington, proposed that aggression was due to frustration, which was described as an unpleasant emotion resulting from any interference that one might encounter achieving his goal.

Hence, Vladimir Putin's aggression will not end with the Ukrainian abduction and only the future will tell if the economic and social sanctions taken are enough to bring this deadly conflict to an end.

More…

Cyber-Warfare as a Threat to Democracy *25.02.2022*

Cyber-Warfare can be defined as a method of conducting war that includes criminal conduct for destructive purposes. The targets of the actions and their victims are no longer just military or state institutions, but civilians and corporations, with the infrastructures required to support our daily needs. The combination of new power entities, either supported by the monetary interests of a few High-Tech companies or the application of cyber-warfare serving governmental interests for territorial control, has created a global 'no-win' scenario.

One possible way for counteracting this trend is related to the concept of a Digital Magna Carta which complements the provisions of the UN's Universal Declaration of Human Rights.

More…

Nanobots: Accelerating Science With No End In Sight? *17.12.2021*

Precision-medicine and its application of nanobots are examples of an exponential trajectory of scientific and technological progress with no limit in sight so far. Futurist Ray Kurzweil suggests that neural nanobots could be used to connect the neocortex of the human brain to a synthetic copy in the cloud, empowering individuals to instantly access all stored knowledge accessible by the Internet.

As the data exchanged between the brain and its cloud-replica can be hacked or manipulated, a new chapter of 'Surveillance Capitalism' - to use Harvard Professor Shoshana Zuboff's terminology – is emerging. According to her, a human revolt is probably needed to stop this trajectory.

More…

The Stanford AI100 Report: Is AI at an Inflection Point? *22.10.2021*

This essay is an attempt to define why a highly reputable scientific community, authoring an eighty-two pages report, comes to the conclusion that AI is at an inflection point. AI technologies that augment human capabilities can be very valuable in situations where humans and AI have complementary strengths. However, we are confronted with the fact that AI-systems are being used in the service of disinformation with the potential to become a threat to democracy and a tool for fascism.

The success of the field will be measured by how it has empowered all people, not by how efficiently machines devalue the people we are trying to help.

More…

News-Addiction: What are the Issues? *08.10.2021*

As digital transformation accelerates, interacting with 'virtuality' as an abstraction of the real world has created new forms of media-consumption. The human psyche is marked by a lifelong tendency to seek and acquire information. Novelty-seeking is one of the traits that keeps people healthy and happy. Curiosity derives from an 'information-gap' - the difference between what you know and what you want to know, hence News-Addiction might evolve.

As a result, a relentless drive to fill the 'information-gap', is further enhanced by a feeling of increasing boredom with nothing to make-up the lack of 'news' unless the addictive cycle of relentless and compulsive news gathering is resumed.

More…

The Future of Social Media, a Journey to Nowhere? *30.07.2021*

The rise of social media have accelerated changes to our social systems. More than four billion people are spending several hours per day with social media. Technology—especially the smartphone—allows us to produce and share a narrative of our lives, to choose what to remember and what to contribute to our own mythos, seeking rewards from 'friends' through 'likes'. Mounting evidence supports the suspicion that Social Media can be addictive and impact personality development with long-term consequences not yet understood.

We lack the scientific and regulatory framework that technology companies and their regulators need to avoid a potentially destructive outcome.

More…

AI and Surveillance Capitalism, what about Autonomy? *26.02.2021*

Surveillance capitalism is an economic system centred around the commodification of personal data with the core purpose of profit-making. In her latest book 'The Age of Surveillance Capitalism' Shoshana Zuboff, Professor at Harvard, provides a detailed examination of the unprecedented power of surveillance capitalism and the quest by powerful corporations to predict and control our behaviour. In her view industrial capitalism exploited nature while surveillance capitalism now exploits human nature.

The stronger personal autonomy is, the more fulfilled and productive a human being may become in adapting to today's socioeconomic demands. Hence, a mindset of personal autonomy is fundamental vis-à-vis the potential negative impacts of surveillance capitalism.

More…

US Democracy in Trouble, what about AI? *20.11.2020*

Manipulative messaging at an emotional level is Donald Trump's approach to gain public support. The 'Terror Management Theory' assumes that existential terror and anxiety is always residing below the surface of one's awareness. To manage this terror, humans adopt views, like religions, political ideologies, and national identities, far from any rational arguments. Moreover, studies conducted by the Pew Research Center in October 2020 show that Democrats and Republicans largely disagree on key values. Hopefully, the upcoming US administration will be successful in reducing frustration and hate under the slogan of 'Making Democracy Great Again'.

More…

AI for Survival of the Fittest? *31.07.2020*

Evolution did not reach the status of being a scientific theory until Charles Darwin published his famous book 'On the Origin of Species' in 1859. Only the 'fittest' organisms are likely to survive, passing on their traits to the next generation. The augmentation of human intelligence with machines is impacting our societies as those ahead in developing and applying this technology are more fit for survival than those which stay behind.

The upcoming automation of AI and the availability of new brain-interface technology to augment and enhance human's intellectual capacity stipulate that evolution is gradually shifting to a selection based on technological supremacy.

More…

Covid-19: Accelerating Human-Level AI, what about Fear? *24.04.2020*

Covid-19 is causing a major disruption to our individual, social and corporate well-being. As scientists and researchers race to understand the behaviour of the virus and how to fight it, fear about its devastating potential is growing. Bodily reactions individually monitored with sensors in real-time, provide information about our emotional response, supporting our sense of control and our ability to reduce the paralyzing effects of fear.

Raising awareness and understanding of our emotions combined with the rationality of intelligent machines are fundamental to fight off the potentially devastating impact of a global pandemic.

More…

From the Corona Pandemic to Machine Viruses *27.03.2020*

We have the means to uncover the start of a pandemic like never possible before. Personal tracking data (GPS) coupled with body sensor information (body temperature, heart rate, brain activity etc.) provide potential disease-status-information in real-time which can be processed by powerful service centres. The existing threat of machine viruses, personal data theft, extortion with ransomware or the distribution of fake information is likely to pose a threat as serious as global pandemics. While biotechnology stands a good chance to keep future pandemics in check, punishment and imprisonment of cyber-criminals is a must to assure future prosperity and human wellbeing.

More…

From Gutenberg to Machine Intelligence and Beyond *07.02.2020*

What happens when machines with human-level AI become reality? To answer this question, it becomes obvious that our values must be implemented in AI-technology to reach the objective of advancing humanity beyond the prevailing knowledge and communication culture. Humanity has gone through cultural shifts before. Considering the timeline documented by this essay, it is obvious that the cultural shift towards human-level AI happens exponentially, raising many issues as to how individuals can be motivated to adapt. Mastering this challenge will set free human creativity, drawing on the fact that humans are more than just containers of intelligence.

More….

Networked-AI: From Vision to Reality *02.08.2019*

Networked-AI is a tool to support humans, it is human-centered. While connectivity and reach of the network are global, the application of Networked-AI is executed locally, contributing to the prosperity of the community and the national budget. Networked-AI is an emerging property driven by three scientific disciplines: Information Technology, Neuroscience and Neurophilosophy.

The distribution of digital knowledge is a development process that will take place over many years to come. To follow and understand this fundamental change, AI needs to be demystified to the point where any individual with an average IQ can comprehend what is happening.

More….

New OECD principles to foster Human-Centric AI *07.06.2019*

On May 22, 2019, the OECD's 36 member countries including the US, formally adopted the first set of intergovernmental policy guidelines on Artificial Intelligence (AI), agreeing to uphold international standards to ensure that AI systems are designed to be robust, safe, fair and trustworthy.

Degrading humanity towards manipulated, brain-hacked servants as the historian and philosopher Yuval Noah Harari is concerned about, strongly differs from the goals defined by the OECD principles.

Human-Centric AI enhances and empowers humans rather than replacing and controlling them. Hence the five OECD principles are fully aligned to the goals of Human-Centric AI.

More….

Is AI steering us towards a Collapse of Western Civilization? *15.03.2019*

In theory, a civilization might be less vulnerable to collapse if new technologies can mitigate against pressures such as climate change. Our technological capabilities may have the potential to delay collapse. In the past, collapse was confined to regions – it was a temporary setback, and people often could return to agrarian lifestyles following the collapse. However, the world is now deeply interconnected and interdependent. Additionally, new instruments of violence, such as lethal autonomous weapons, will be available soon. The most dangerous threat, however, comes from the exponentially rising complexity induced by AI in combination with the rise of inequality and oligarchy by tech-giants such as Facebook, Google and Amazon.

More….

Towards a Charta for Machine-Interaction *23.11.2018*

Today's conversational support-services and assistants are voice-activated. Based on natural language processing and speech recognition, these so-called 'bots' provide voice and text answers to questions submitted via smart speakers or phones. However, the future of voice will probably not be relative to speakers alone. The Avatar appears as a screen-based simulation of a fictional Human who is able to sense and monitor the emotions, the physical well-being and the intellectual capacity of its human counterpart. As Singularity will arrive, a Charta is needed to augment and balance the unique capabilities of Humans and AI-Machines in form of an Ecosystem.

More….

Machine-Emotions and the Struggle for Power over Humans *09.11.2018*

One of the founding fathers of AI, Marvin Minsky, was once questioned about machine-emotions and said: "The question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions". Augmenting an AI focused on mathematics and statistics with an AI focused on emotion sets the stage of unprecedented power exercised by a few tech conglomerates. It is the balance between the ever-increasing power of the new potentate – the intelligent machine – and the role of human beings that needs to be defined and regulated.

More….

Should Machine-Intelligence Be Taxed? *09.02.2018*

The phenomenal growth of Facebook, Google and Amazon (FGAs) is based on a simple but very powerful business model: Provide a service at no charge to get personal data and monetize this date for targeted advertising. The current financial tax contribution of the FGAs to government institutions will not be enough to cover their fair share of the social costs caused by the disruptive impact of machine-intelligence. To maintain our democratic values, we need a redesign of our tax and social welfare system that takes into account the impact of machine-intelligence.

More…

China's move to reach AI world-supremacy by 2030 *26.01.2018*

In July 2017, China's State Council announced the "Next Generation Artificial Intelligence Development Plan". The Chinese government's plan aims (a) to keep pace with Western AI technology by 2020, (b) make major breakthroughs by 2025, and (c) lead the world in AI by 2030. The question looms as to what our Western democratic society can do to stay ahead of this race and to maintain our values. Intelligence 'Made in China' is likely to be more than just a service- or product offering, it could also be a cultural imperative.

More…

Thoughts about the Future Impact of AI in our Society *15.12.2017*

Discussions about the consequences of AI are far reaching and reviewing it requires some guidelines to avoid being trapped in speculation and science fiction scenarios. While the potential for positive consequences should be enhanced, it is vital that our society sets up barriers against misuse and propagation of negative impacts. To assess the consequences of Artificial Intelligence (AI) being equal to Natural Intelligence (NI), it helps to differentiate between economic, social and individual contexts.

More…

3.3 Individual/Ethics

Emotional AI: The Problem with Acceptance and Trust *29.12.2023*

To trust we need to engage in truth. In AI-technology, truth means nothing. The imitation and original are the same. Emotions are difficult to read and there is a disconnect between what people say they feel and what they actually do feel. Yet, acceptance and trust are growing as emotion AI is entering our daily lives. If AI can gain emotional intelligence, maybe it can also replicate those emotions. Emotional AI might better understand human behavior and its relationship to intelligence, improving human communication. However, as AI has the ability to understand human emotions, it could be used in ways that compromise user privacy by monitoring and analysing emotional reactions infringing on consumer privacy rights.

More…

AI and the Growing Problem of Trust *08.09.2023*

Generative AI may be riddled with hallucinations and bias, yet despite the potential for cyberattacks and deepfakes, consumer awareness of the risks is low. Intuitively we know that different levels of trust exist in different kinds of organizations. In high-trust organization competence is vital and it must be aimed at a shared mission.

Focusing on GPT-3.5 and GPT-4, researchers at Stanford found that these models might leak private information when training them with data generated by user conversations. Hence, trust is fading.

Vendors of AI-tools claim enormous productivity gains which are nowhere close to reality. As a result, distrust grows about the future potential of generative AI.

More…

The Metaverse – Hype or Paradigm Shift? *11.02.2022*

There is no exact definition of the metaverse. A virtual reality space for artificial interaction by humans and avatars, combining specialized computer systems, visual interfaces, sensors and software might best describe the potential of its functionality. A paradigm shift is defined as an important change that happens when the usual way of thinking or doing something is replaced by a new and different way. Whether the metaverse represents a paradigm shift, one has to contrast its design concept with other scientific achievements related to human behaviour.

The metaverse is a great tool for gaming, education and experimentation, yet lacks the components of a paradigm shift and what the reality of life is all about.

More…

The Need to Redefine Intelligence: From IQ to EQ to AIQ *23.04.2021*

While the EQ has gained in importance with intelligent machines gradually replacing cognitive tasks, a new 'AIQ' will provide guidance to optimally "cross the bridge" between artificial and human intelligence. With this bridge in place, we can test and compare our true thinking capacity with artificially computed results. Doing so, we must understand the limits and advantages of the artificial version as much as we need to understand the limits of our own personality. Hence, in addition to IQ und EQ, a newly defined AIQ is required for testing one's creativity and ability for assessing the solution proposed by the AI system. Introducing the AIQ requires an adjustment of our educational concepts with creativity as its main driver.

More…

From Self-Reflection to Spirituality, what about AI? *12.03.2021*

Awareness is growing that human self-reflection and spirituality can be a vital resource in solving today's global problems, challenging the role of AI as the single source of new knowledge. The links of our spirituality to our intelligence and its conduits to the biological, neural sphere are not yet fully understood, but scientific enquiry oriented to enhance the biological in humans and replicating it in machines is growing exponentially. Historically, nature, mountains, rivers, trees, the sun, the moon have always been honoured in ancient cultures as a source of enlightenment. Expanding our awareness about nature, with AI as a tool, might well support our endeavour of leading a meaningful life.

More…

From Covid-19 back to the Future with AI *04.12.2020*

According to the WHO about 8.5% of the world's population are currently infected or have died because of Covid-19, compared to 30% who were infected or died due to the Spanish Flu. The application of AI such as the rapid development of new vaccines have so far played a major role in preventing a global disaster. Yet the Covid-19 pandemic has left serious scars both individually as well as economically. The massive rise of unemployment due to corporate closings severely threatens the foundation of our socioeconomic balance. To heal the scars and to restore trust in our democratic culture we need a creative mindset of solving problems by fostering the cooperation between humans and intelligent machines.

More…

Mental Health a Rising Concern, what about AI + Education? *09.10.2020*

Anxiety is the reaction to stressful, dangerous, or unfamiliar situations. It is the sense of uneasiness, distress, or dread you feel before a significant event. The risk of anxiety causing depression can, in the worst case, lead to self-destructive actions. Existential concerns are one the most mentioned reasons for anxiety as the potential loss of jobs due to digital transformation and automation has become a highly publicized issue. Creativity is expected to become more valuable than technical skills as artificial intelligence outpaces human cognition. Fostering creative thinkers must become a primary focus of educators. Expanding the horizon of individual's awareness, the study of humanities must resurge as cognitive skills to solve technical problems will gradually be automated.

More…

Deepfakes: Can AI restore Trust and what about Truth? *28.08.2020*

The rise of fake information and the proliferation of artificially generated narratives are challenging publishers as well as social media and e-commerce platforms.

AI provides tools to detect Deepfakes, yet there will be counterefforts to bypass this detection. In this technology-based 'cops and robbers' scenario, to distinguish fake from reality and the danger of being manipulated, we have to resort to consciousness and common-sense for the protection of our integrity. Humans have become 'sandwiched' between fake- manipulation and trust. To get out of this position we must apply our unique capacity: **think**.

More…

The Cultural Shift provoked by Networked AI *19.07.2019*

Culture is vital because it enables its members to function with one another without the need to negotiate meaning at every moment. As our daily lives are more and more penetrated and influenced by networked AI, its consequences require reflection. This mindset is a must to take advantage of the ever-growing usability and capability of networked AI.

To successfully adapt to a cultural shift requires foremost two things: life-long education and the implementation of ethics that define and secure our values in a new age of human existence.

More….

Is Facebook a 'Digital Gangster'? What about Ethics? *01.03.2019*

Following an inquiry launched in 2017 as concern grew about the influence of false information and its ability to be spread unscrutinised on social media, a UK parliamentary committee has published its findings on February 18, 2019, after an 18-month investigation into disinformation and fake news. It could be vital that IEEE's proposed standard 'P7008 for Ethically Driven Nudging by Robotic, Intelligent and Autonomous Systems' in combination with strong government supported regulations against misuse can restore trust into internet applications and social media. Fighting this attempt, as perceived by the UK's Parliamentary Committee when investigating Facebook, is likely to provoke the 'Digital Gangster' image.

More….

From Privacy Invasion to Identity Loss? *06.04.2018*

Facebook's data breach disaster is a good indicator of how much private data of internet users has become a commodity to manipulate human decision-making on a massive scale. Using the internet leaves a digital footprint which can be analysed. Information about one's personality can be predicted from Facebook 'Likes' or Tweets. Personality profiling will reach a level of perfection where humans might succumb to the manipulation of intelligent machines. However, persuasion and manipulation by these machines and their algorithms can be curbed by our own sense of identity and self-awareness.

More….

AI and Neuro-Technology: Ethics a must for Human Survival *17.11.2017*

As Neuroscience and AI is beginning to merge to come up with a true 'Artificial General Intelligence (AGI)' the 'issue of ethics' needs new attention. Technological developments in machine intelligence and Neuro-Technology implicate that it will be possible to decode people's mental processes and directly manipulate the brain mechanisms underlying their intentions, emotions and decisions.

Consequently, the current efforts to incorporate standards of ethics in AI have to be extended to include Neuro-Technology as well. There is no way to reap the potential benefits of Singularity without the adaptation and implementation of strong ethics fostering our human values.

More…

Google adds Ethics Unit to reach AI Supremacy *20.10.2017*

Google has implemented the world's most powerful network of data centres. With its own AI-optimized hardware design, Google currently provides services to 2 billion active Android devices, 1 billion You Tube users watching 1 billion hours of video every day and handling over 1 million search inquiries per second. In a bold move to take leadership in the discussion about ethics, DeepMind, Google's subsidiary, also known for its AlphaGo software that beat the world's best Go player, has announced the formation of a major new AI research unit called 'Deep Mind Ethics and Society (DMES)' comprised of a full-time staff and external advisors.

More…

Content Personalization vs. Privacy and Trust *08.09.2017*

Online content is becoming increasingly personalized. As firms have expanded their data collection efforts to link data across sites, everything from the advertisements a user sees to the top search results on Google has been enhanced for personal relevance. The invasion of AI technology and Neuroscience is crossing the border into our private sphere. 'Smart home' applications based on IoT devices or bidirectional loudspeakers are opening new paths to profile the user including emotion sensing. We all know that it takes years building trust, seconds to break and forever to repair. Trust requires transparency, something the big tech companies only partially provide. Many of us don't trust Google, Facebook, Amazon and Co. but we like the convenience their products are providing.

More…

AI and Big Data: What about Privacy Protection? *21.04.2017*

Imagine a world where an authoritarian government monitors everything you do, collects huge amounts of data on almost every interaction you make, and provides you with a score that measures how "trustworthy" you are. Contrary to the concept of a totalitarian society, the individual, his personal welfare and rights and responsibility within society represent what we consider democratic values. These values are threatened to be undermined by companies monopolizing internet usage for monetary reasons. To manage the rising complexity of our internet footprint opens a business proposition for a Trusted-Data-Service-Provider offering individuals a range of privacy protection.

More…

AI and Neuroscience on the Crossroad to Ethics *07.04.2017*

Whereas developments in technology have been largely driven by economics and market demand governed by regulations concerning product safety and environmental issues, developments in medical science and artificial intelligence (AI) must also consider ethical standards. As AI invades our personal integrity be it through behavioural data collected via internet transactions or be it through brain computer interfaces (BCIs) we have reached a crossroad in ethics both on a technological as well as a medical and neuroscientific track. BCI based 'Brain Doping' represents a new dimension of human performance enhancement that goes way beyond our legal framework of applying drugs or psychotherapy to fight performance problems.

More…

Should we trust Artificial Intelligent Machines (AIMs)? *10.03.2017*

Trust is a vital element of corporate culture and leaders understand its importance. In its 2016 global CEO survey, PwC (PricewaterhouseCoopers) reported that 55% of CEOs think that a lack of trust is a threat to their organization's growth. Companies engaged in business-to-business activities like IBM promoting the application of AIM services in the health sector for example, need to incorporate the trust factor into their products in order to expand their business. Consequently, it is the quality of the product that will answer the question if AIMs can be trusted.

More…

Ethics and Artificial Intelligence *16.12.2016*

Ethics or moral philosophy is a branch of philosophy that involves systematizing, defending, and recommending concepts of right and wrong conduct. In practice, ethics seeks to resolve questions of human morality, by defining concepts such as good and evil, right and wrong, virtue and vice, justice and crime. The possibility of creating thinking machines raises a host of ethical issues. These questions relate both to ensuring that such machines do not harm humans and other morally relevant beings. As humans are applying ethical standards to their decision-making processes it seems reasonable to implement a set of equivalent ethical ground rules or algorithms within the software of Artificial Intelligent Machines (AIMs).

More…