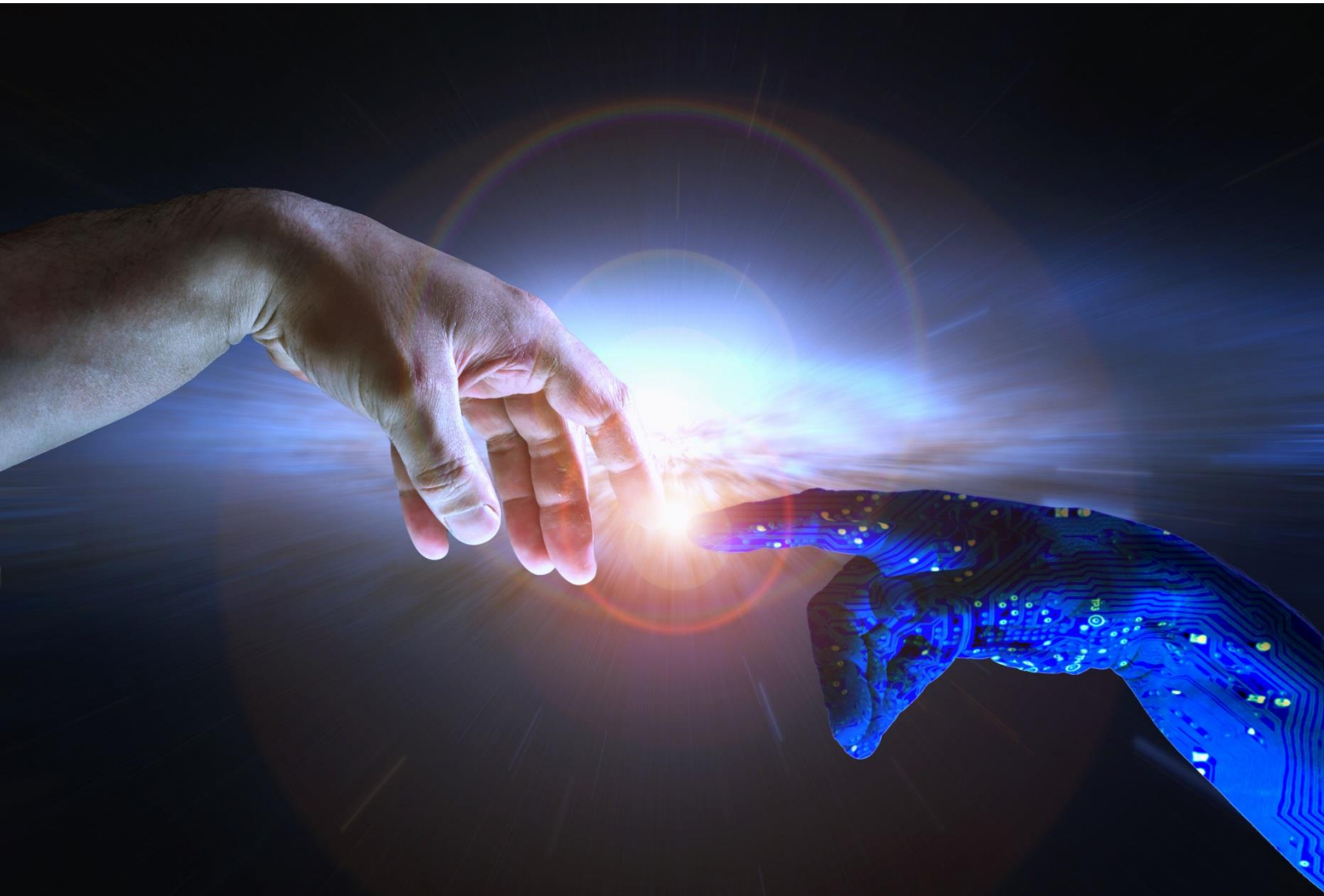




CANADIAN GERMAN CHAMBER OF INDUSTRY AND COMMERCE INC.
LA CHAMBRE CANADIENNE ALLEMANDE DE L'INDUSTRIE ET DU COMMERCE INC.
DEUTSCH-KANADISCHE INDUSTRIE - UND HANDELSKAMMER

TORONTO



Conference Report

“AI Conference in Karlsruhe”

The Transatlantic Dialogue Initiative - Together Into the Future

June 21, 2018, @ Schlosshotel Karlsruhe
www.germanchamber.ca / www.transatlanticdialogue.ca

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As part of the [Transatlantic Dialogue Initiative](#), which is financially backed by the Federal Ministry for Economic Affairs & Energy of Germany, the Canadian German Chamber of Industry & Commerce Inc. organized a Big Data & Cybersecurity conference on June 21th 2018 in Karlsruhe. The chamber hereby brought several Canadian experts to Germany in order to discuss relevant topic within the field of Artificial Intelligence together with German experts during three panel discussion rounds. The three topics of interest which were discussed were “1. *Human-Machine Interaction*”, “2. *AI & Ethics*” and “3. *Improving Energy Efficiency through AI*”.

This report outlines the different conversations and its key discussion points made between the Canadian and German panel participants.

Panel 1: Human-Machine Interaction

The first panel discussion focussed on the new developments in Human-Machine Interaction. Participants of the panel were Karim Osmane (Doctorate Research Candidate at University of Sherbrooke and Founder of Mastermind), Jean-François Poulin (UX Consultant at Ergoweb Canada Inc.), Mo Moubarak (Head of Business Development at Moberries) and Alfred Ermer (CEO at arago da vinci GmbH). The panel was moderated by Stefanie

Dreyer (TV-Presenter, Journalist and Economist).

Your new partner: Mr. Robot

The changing employment landscape and how AI is supposedly replacing humans in some aspects of the economy is one of the most important discussions. One of the panel participants pointed out that “we’re possessed by artificial intelligence”, however, that “lower level jobs should actually be taken over by machines.” Redundant jobs will be replaced by more efficient technology and more meaningful jobs will be created. AI will hereby free up parts of the workforce, where machines, hand-in-hand with humans, can jointly work on solving the real problems of this planet. The role of machines will hereby shift away from just assisting humans to being that of a real partner. The replacement of certain tasks through intelligent machines would only become a problem when there are no more physical jobs available for those who cannot do anything else.

We do not need to create a more powerful and intelligent machine than us. Many think that this is going to be the case and lead to a large segment of the working population losing their job. However, AI improves our lives significantly. In customer support, procurement, healthcare and online learning it has already made significant progress. We need to manage the fear which comes with the associated



changes. In line with this discussion experts often refer to the industrial revolution which also led to a huge shift in job expertise. As one of the panellists elaborated: “during the industrial revolution we saw largely rural populations move from the fields into the quickly industrializing cities, forming the foundation of modern society. Society at the time moved transformed from a mostly agricultural one - a society where people would perform hard physical labor for long hours on the fields - into being an industrial one. Most of the work happened in factories and on assembly lines in urban areas. This led to large gains in productivity and efficiency, benefiting the economy and society at large.” Nonetheless, it did not happen without controversy and the associated changes were met with resistance at the time.

What can and should we do?

What needs to happen at this point is to define the relationship humanity wants to have with intelligent machines and how this will progress, the smarter the AI will become and when it starts carrying out more complex tasks. We already need to think about a strong framework with which society can cope with this progressing intelligence.

As one panel participant commented: “it all comes down to governance. Government should have some sort of control over the powerful algorithms on which AI will run on and which will

control large portions of our lives.” Companies are profit oriented and will therefore program the artificial intelligence which they use so to maximize financial gains. Governments will therefore have to come up with a solution to integrate ethics into the technology and establish some sort of “ethics police” or institution which monitors this.

Panel 2: AI & Ethics

The second panel discussion focused on the topic AI & Ethics and was moderated by Erick Sabelskjöld (Mentor at Startupbootcamp), where the panel speakers were Nicolai Pogadl (Project Manager at the Montreal Institute for Global Stability at Concordia University), Prof. Dott. Ing. Roberto Zicari (Professor of database and information systems at the Goethe University of Frankfurt), Dr. Claudio Huyskens (Founder & CEO of fedger.io) and Dirk Hommrich (Senior Researcher at ITAS of the Karlsruhe Institute of Technology).

Will machines take over ethics?

One of the biggest challenges we will be facing today is that technology will have to make ethical decisions for humans. Ethical decision-making is taken away in several forms from the individual human level and assigned to the artificial intelligence, which will have to make collective ethical

decisions. Ethical behavior however is defined differently by everyone. Behavior which is seen as acceptable by one individual can already be totally incompatible with what another individual perceives as ethically compatible behavior. It will be very difficult - maybe even close to impossible - to come up with a model that integrates and includes decision-making models which are perceived as ethically acceptable by everyone.

We are still at the point of debating the famous scenario where a plane has to decide where to crash: into the airport terminal or into the city center? How can the artificial intelligence calculate where more people get killed and which lives are worthwhile saving and which ones not? One of the experts pointed out that: "it is a challenge to program such a decision-making path into a machine and justify its decision. There are doubts whether it will ever be possible to program something as difficult as this into technology and should we even do so? Besides, who will hold the ultimate responsibility for ethical decision making of the artificial intelligence?"

There is also the question of whether statistical decision making models are enough when it comes to machines making an ethical decision. Some aspects are not accurately measurable through numerical means. We therefore have to think about possibly including other decision making streams, in order

to come to conclusions which are ethically compatible with the majority of users.

The black box issue

Another prevailing problem is that with AI we still have the infamous '[black box issue](#)'. Commands go into the technology and results come out of it, where there is no transparency regarding the process of how the decision-making was done and what the ethics behind it are. Businesses currently follow consumer demands for ethically responsible behavior. However, as this ethical decision making path is so deeply hidden within the coding of the technology, it will be difficult for consumers to see how ethics is integrated into it. We therefore need to start thinking about how we make this more transparent for users and also make it appear in a comprehensive manner.

Regulations need to occur at this point. Too many regulations will slow down technological progress and lead to that competition will take the lead. Too few regulations will leave us with technology which has no ethics integrated into it at all. There needs to be a balance. Nonetheless, the current status is that there is no regulation whatsoever. Therefore it is suggested that we require a neutral third party between the private industry and the consumer in order to oversee the integration of ethical decision making into AI.

Panel 3: Improving Energy Efficiency through AI

The third panel discussion focussed on how to improve energy efficiency through the usage of AI applications. This discussion was moderated by Dr. Rüdiger Rentsch (Senior Scientist at the University of Bremen), where the panel speakers were Davis Sawyer (Co-founder of Deeplite), Prof. Dr. Ralf Mikut (Head of Research Area Automated Image and Data Analysis at Institute for Automation and Applied Informatics at KIT) and Gaurav Tripathi (Co-Founder and CTO of Innoplexus).

The challenges

Google is one of the companies which uses algorithms to improve energy efficiency. [DeepMind](#), a Google subsidiary, and the UK National Grid have outlined plans to integrate artificial intelligence to the nation's electricity grid system. It is expected that this project will process large volumes of information from weather forecast data and internet searches to create predictive models for fluctuations in electricity demand. Nonetheless, there is a problem regarding the operational efficiency, where one can see a serious mismatch.

Energy is not very intelligently used yet, especially when it comes to renewables. This mismatch is also sometimes exemplified by the "[duck curve](#)" - a graph outlining power production over the course of a day

which shows the timing imbalance between peak consumer demand for energy and peak renewable energy production as the sun rises. Even though the energy efficiency of equipment is improving; especially Germany is facing challenges caused by this mismatch due to its renewable energy dependency, which will only increase over the next decades. AI could hereby help to lessen the gap between peak energy demand and its consumption.

Solutions

Data from many different sources could intelligently be combined, in order to further enhance energy efficiency. Humans consume most energy and we can use AI for observing and shaping human behavior by either allowing technology to closely monitors how we behave and adapts its energy usage to it or where it tries to influence human behavior, so to lower energy usage. A good example is Nest's Learning Thermostat. This smart thermostat is able to reduce energy consumption by adapting to user behavior. It is able to study its occupants' behavior and adjust the home temperature accordingly, resulting in energy savings of up to 12%. The gained information on patterns of human behavior can thereby be used to shift energy demand away from peak times which cause such a particular challenges for renewable energy producers.

However, in order to take full advantage of this technology we would have to rethink the design of buildings and infrastructure, as we need to facilitate data collection. Without good quality data the best AI will be worthless in helping with energy savings. Besides, the amount of energy required to process the large quantity of data for AI applications already poses a serious challenges by itself. Providers who will run the servers processing the energy usage data will have to find sustainable energy sources themselves.

END

This conference is part of the [Transatlantic Dialogue - Together Into the Future](#) initiative. The [Federal Ministry for Economic Affairs & Energy of Germany](#) together with the [Canadian German Chamber of Industry & Commerce Inc.](#) have called into life this initiative in order to strengthen the cooperation between Canada and Germany on the field of Big Data, Cybersecurity and AI. The goal of this initiative is to facilitate the exchange of best practices, concepts, new ideas and the creation of a new network between both countries, thereby creating a platform which fosters innovation. Innovation means progress, and only through progress can we create the future.

This six conferences long series will take place at different locations across Canada (Ottawa, Montreal and Toronto) and Germany (Karlsruhe, Dortmund and Berlin). Each of the conferences will have three panel discussions about sub-topics within the field of Big Data, Cybersecurity and AI. We will hereby organize a delegation with experts to the host country in order to vividly discuss the topics of interest at each conference and show the participants for a week what the other country has to offer in this area.