Session A2

Our digital colleague. Tracing the transformation of science and research by artificial intelligence and big data

Chairs: Stephan Lingner and Jan C. Schmidt (EA European Academy of Technology and Innovation Assessment/Darmstadt University of Applied Sciences)

The digitalization and computerization of working environments is reaching all areas of publicly or privately funded science and research. New developments in the field of artificial intelligence (AI) and big data now lead us to anticipate a quantum leap forward towards the future of basic and application-oriented research: systems pertinent to the concept of AI seem to mimic the natural network architectures of the human brain and facilitate their own "learning ability". They are capable of making "experience-driven" adjustments to their inventory of rewritable algorithms, more or less independent of human programmers. Characterized as cognitive computing or machine learning, these capabilities of technical "intelligence" facilitate the use of these systems even for demanding tasks that were previously reserved for human scientists. However, the inherent learning ability, flexibility and "autonomy" of these systems also means that often their internal processes remain hidden – in contrast to traditional numerical models, which might be complex but still open for assessment by the experts. For now, we have neither rudimentarily understood nor rationally assessed the perspectives and consequences of the use of adaptive algorithmic systems and their interaction with their human "colleagues" in science and research.

Abstracts to this session are invited to discuss following value-based questions on AI in research among others:

- What does the "cooperation" with AI mean for established research cultures and traditions? To what extent do the workplace and the working environment of the researchers change? According to which criteria can the transformation be analyzed and traced?
- What does it mean for the autonomy and self-concept of researchers? Will this development lead to some sort of technology paternalism?
- What might change w.r.t. the power of scientific explanation and justification? E.g., will the traditional objective of sciences to provide causal knowledge be replaced by correlations?
- What is the role of new commercial suppliers of AI in science? Will be research compromised by commercial interests? Who are the legitimate owners of data and knowledge, then?
- Will AI change the conditions for broad access to and fair sharing of related data? Will patterns of competition change (both individually and an institutional levels)?
- Will AI tackle the transparency and quality of research? How can be epistemic robustness ensured? What would be future standards of best practise, then?
- Who has to be made responsible and accountable for scientific results from "mixed teams" of AI and human researchers?
- Which specific challenges to TA are involved in this emerging field? What TA methods can be applied to analyze and assess the transformation of science and research?

Speakers:

- AI/Information Technology: Prof. Bernhard G. HUMM, Ph.D. /Darmstadt University of Applied Sciences (h_da)
- Technology Assessment: Dr. Mag. Michael NENTWICH/Institute of Technology Assessment (ITA), Vienna
- Algorithmic culture: Dr. Jan-Hendrik PASSOTH/Munich Center for Technology in Society (MCTS)
- Algorithmic Management: Prof. Dr. Sarah SPIEKERMANN-HOFF/Wirtschaftsuniversität Wien (WU)

The session will also engage the participants to the current EA project “DiA – Digital worlds of work in research and development. New options and challenges for science”.