Call for Abstracts: "Modeling for policy: Decision making with AI, models, and computer simulations – challenges for TA from new prognostic methods"

TATuP special topic in issues 1/2023

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Extended deadline for submitting your abstract: 17 May 2022

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Topic

Models are indispensable for today's policy making. Computer-based models, and increasingly machine learning models, are playing an important role in decision-making. This became clear to the general public, for example, when, during the COVID-19 pandemic, forecasts of infection dynamics based on computer simulations were used to evaluate and justify policy measures for containment.[1] Beyond this current spotlight, there are numerous contexts in which computer models provide information on the possible courses of action or even make automated decisions: examples range from financial markets to the transformation of transportation, to policing and security, climate change and energy transition. In this Call for Abstracts, we consider the role of computational models based on machine learning or computer simulation.

Computer-based models also play an important role in the field of technology assessment. Possible futures tied to specific technologies, such as in the area of the energy system analysis, are explored by using computer simulations. But AI models are also gaining importance here. This can result in a mix of methods, when computer simulations, machine learning (and classical experiments) converge. This may pose special challenges. One example are assessments of self-driving cars. AI models that control self-driving cars are now tested primarily on the basis of computer simulations and experiments. Here, a complex (and opaque) model is tested by other complex (and opaque) models challenging, for instance, quality management and technology assessment. This mix of methods rises questions on the reproducibility of results, on justification and trust, and on the general nature of knowledge and decisions gained from AI-inspired simulation models for policy advice.

AI models, and simulations models therefore present a dual challenge for technology assessment (TA):

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[1] The Federal High Performance Computing Center in Stuttgart (HLRS) is involved in the forecasts that estimate the need for intensive care beds. They are communicated to the Robert Koch Institute, which then submits them to the Federal Ministry of Health.

1. These prognostic methods are used in the object domain of TA.

2. TA makes use of these methods itself.

In our view, this raises far-reaching epistemic as well as normative questions for TA. These concern, for example, the transparency of TA: the opacity of the models is inherited as a possible opacity of TA. Questions also arise about the robustness of models, especially in novel domains, which then appear as questions about the evaluation of values in TA: is reliability something more important than comprehensibility?

Requested research articles

We call for contributions that investigate whether and, if so, how decisions change, if they are made on the basis of AI and computer models. Do options for action, evaluations, forecasts or justifications change when policy making decisions are made on the basis of models? And, on a second level, to what extent does this change technology assessment, insofar as computer-based models are used to assess technologies? Does it change the courses of action considered in TA?

We welcome case studies as well as general considerations on modeling for policy, which explore models as tools for decision-making from the (inter)disciplinary perspectives of scientific communities including historical science, artificial intelligence research, philosophy, political science, simulation science, sociology, STS, or technology assessment.

Modelling for policy and technology assessment

This special issue connects to several fields of interest in TA. It deals with questions of problem-oriented research and questions of policy advice in particular. Although a lot of research has been done on the impact of model results on policy measures and decision making (e.g. decision making under uncertainty), simulation and machine learning models as tools for decision-making and especially for technology assessment have not often been explored in detail.

Scope of models considered in the call

The call considers computer-based models, in particular simulation and machine learning models. Non-computational models are only included insofar as they are combined with computational models. The idea to address computer-based models together in the call is also inspired by the question whether policies and/or TA develop differently depending on certain model types. In many cases machine learning models are less or not at all theory-based (the subject theory here is usually more or less replaced by the learning method). Will this lead to a different way of dealing with these models? To other decision or different kind of decision-making?

Central research questions

1. How are simulation and AI models used as tools for decision-making in the context of policy making and TA?
2. Do decisions change through the use of computer-based models?
3. Do TA recommendations change in a similar way?

This leads to the following set of sub-questions, among others:

- What is the role of model opacity in the decision context?
- Are power constellations changing due to the more significant role of modelers?

- What is the role of trust and distrust in the models used?
- Models as well (as decisions) are based on values. But these values can remain hidden. What is the connection between values in models and values that orient decisions?

How are decisions communicated and justified across system boundaries? (Modeling science, politics, public)

Guest editors of this TATuP special topic

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Science and Art of Simulation (Springer 2017), *Zur Philosophie informeller Technisierung* (Wiss. Buchgesellschaft 2014), *Technik als Erwartung* (Transcript 2010).

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https://www.itas.kit.edu/kollegium_scheer_dirk.php

Submissions

- Please send your abstract by e-mail to redaktion@tatup.de by 17 **May 2022** at the latest;
- Length of the abstract: max. 1.5 pages;
- the editorial office will correspond with the author submitting the abstract;
- please state full names, e-mail addresses, and institutional affiliations of all co-authors of the abstract.

Editorial process

17 May 2022:	Deadline for submitting your abstract.
End of May 2022:	Decision on inviting authors to submit a full manuscript.
August 2022:	Deadline for submitting your full manuscript, followed by a double non-blind review process.
October 2022:	Feedback from the reviewers, followed by authors' revisions by end of September 2022.
December 2022	Feedback on revisions.
February 2023:	End of revision period.
March 2023:	Publication (print and online).