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EDITORIAL

AI, Kitsch, and Communication

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Dear readers,

We all know kitsch. We may disagree on singular items, as do the social scientists trying to precisely define or characterize kitsch in theory. But there are clear prototypes. My favorite is copper relief versions, typically mounted on wooden plates, of Dürer's *Praying Hands*. Not only works of art may turn into iconized kitsch items, but also works of engineering: think of the Golden Gate Bridge stuff you will find in San Francisco souvenir shops. And even genuine science gets its kitsch incarnations: the many displays of $E = mc^2$ on T-shirts and coffee mugs, for example. Hollywood movies about episodes of scientists' lives, too, tend to scratch hard on the science kitsch scale—think of *Enigma*, featuring Alan Turing, or *A Beautiful Mind* about John Nash.

Robots, more precisely: humanoid robots, have been inspirations for kitsch ever since they were conceived. Often, the kitsch would be hidden behind the semantic hedge of "toy robot"—but of what use for playing is a battery-powered pile of tin offering no other interaction than switching it on and off? Again, Hollywood movies are great places for robot kitsch, where I do not mean creative and original SciFi featuring robots, but all the more or less entertaining rest—and the perceived border line where good SciFi ends and the rest begins may vary inter-individually.

So, my reaction when I first learned about the blessing robot named BlessU-2[1] was to say, okay, another instance of robot kitsch. Not in a mass reproduction, but as an individual item—which clashes a bit with standard kitsch categories, but robot kitsch anyways. BlessU-2 was set up as a project of the Protestant church of Hessen–Nassau and created by the media artist Alexander Wiedekind–Klein as part of an exhibition at the occasion of the 500th anniversary of the Reformation this year. It is an immobile, sort-of-humanoid, even if partially stick-figured robot that blesses you. Press a button, choose a language, and it will say you a blessing, choosing out of "more than 40 Bible verses". After that, you may order a printout, which will come in the form of a little slip like from a bank teller machine (and deliberately so). Look it up on YouTube, you will find interesting videos.

The church of Hessen–Nassau had a goal about this project, namely, "to challenge people to consider the meaning of blessing and the increasing digitalization with artificial intelligence in the 21st century", and after second thoughts I tend to say that my spontaneous labeling of BlessU-2 as kitsch was too rash. It is rather a piece of media art, albeit with a healthy share of trashy traits. It has—much in line with the project goal—stirred up a tremendous amount of world-wide press coverage, as you can easily verify on the Web.

You may or may not share an interest of the meaning of blessing in today's world, and you may like or dislike the particular way of making an issue out of it in the BlessU-2 project. Anyway, it tells us something about the current perception of AI in society and, consequently, about communicating our field, as a scientific community, to society. Read again the project goal statement cited above, mentioning "digitalization and artificial intelligence". No more insinuation that the very notion of an artificial intelligence is fiction, or hubris, or threat—they take it for granted, and they don't sound uneasy about it.

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[1] http://www.ekhn.de/veranstaltungen/reformation-2017/reformation-stags-nachrichten/news/an-interactive-experiment-blessu-2-the-blessing-robot-3.html.

We can all see in our technical circles the recent excitement about achievements of AI: deep learning, data analytics, features of robot autonomy, and more. In the society at large, this is paralleled by a perception of the field that is much more positive, or at least more open-minded than we were used to for decades. That is good. But then we have to adjust our communication modes in laypeople settings. Little need to defend AI a priori, it seems. But much need to explain it, and—at least according to my own experience—much more motivation in laypeople for following such explanations. And much need to explain the open issues, too, in addition to praising the solved ones. For the public excitement about AI to last, it will be good if fascination about the field and its achievements pairs up with realism about the current limits of what we can do and about expectations of more to come. And yes, the better a technology works, the better it works for critical applications, too. This is not new, but is still true.

Sometimes, we may have to employ some good humor—which brings me back to BlessU-2. When confronted with science kitsch, I tend to feel my lips tighten. But let us think positive. Even if we think it is kitsch, it carries an affirmative connotation: there no kitsch about nasty stuff, or do you know some about headache, taxes, traffic jams? Even if someone or something gets it all wrong about AI and robots when putting them into a positive context, appreciate the positive context. And explain what is wrong, or missing, or misleading. Or go drink a beer with the guy and explain later.

… which leads to a purely personal note to end. After 8 years of co-editing the KI journal, my time slice runs up at the end of 2017. I enjoyed enormously the cooperation with my fellow editors, with the issue editors, and with the Springer staff. Thanks for a great time, for getting to know many people, and for being exposed to topics—scientific or related to journal production—that I would otherwise not have noticed.

Best regards,

Joachim Hertzberg

1 Forthcoming Special Topics

1.1 Algorithmic Challenges and Opportunities of Big Data

Computer systems pervade all parts of human activity and acquire, process, and exchange data at a rapidly increasing pace. As a consequence, we live in a big data world where information is accumulating at an exponential rate and complexity, and often the real problem has shifted from collecting enough data to dealing with its impetuous growth and abundance when going through it to mine relevant or pertinent information. In fact, we often face poor scale-up behaviour from algorithms that have been designed based on models of computation that are no longer realistic for big data. This implies challenges like algorithmic exploitation of parallelism (multicores, GPUs, parallel and distributed systems, etc.), handling external and outsourced memory as well as memory-hierarchies (clouds, distributed storage systems, hard-disks, flash-memory, etc.), dealing with large scale dynamic data updates and streams, compressing and processing compressed data, approximation and online processing respectively mining under resource constraints, increasing the robustness of computations (e.g., concerning data faults, inaccuracies, or attacks) or reducing the consumption of energy by algorithmic measures and learning. Only then big data will truly open up unprecedented opportunities for both scientific discoveries and commercial exploitation in Artificial Intelligence, Geoscience, Social Web, Finance, e-Commerce, Health Care, Environment and Climate, Physics and Astronomy, Chemistry, Agriculture, Life Sciences and Digital Libraries, among other domains.

The aim of the special issue is to collect overview articles on important state-of-the-art algorithmic foundations and applications, as well as articles on emerging trends for the future of big data.

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1.2 Answer Set Programming Unleashed

Answer Set Programming (ASP) has become a popular paradigm for Knowledge Representation and Reasoning (KRR), in particular, when it comes to solving knowledge-intense combinatorial (optimization) problems. The growing popularity of ASP in research and application domains rests upon the following pillars. First, ASP builds upon a simple yet rich modelling language with clear semantics that offers, for instance, cardinality and weight constraints as well as means

to express multi-objective optimization functions. Second, all these constructs are well supported by highly performant solving technology leading to seamless support of such constraints along with sophisticated optimization algorithms. Finally, a primary asset of ASP is its versatility, arguably elicited by its roots in KRR and AI: ASP offers complex reasoning modes for enumerating, intersecting, or unioning solutions, as well as combinations thereof, e.g., intersecting all optimal solutions.

ASP can be looked at from different perspectives. For one, it can be seen as the computational embodiment of non-monotonic reasoning. Similarly, it can be regarded as an extension of propositional logic and its solving machinery with closed world reasoning. For another, it can be viewed as an extension of database systems with possibly recursive rules. And although its original semantics was proposed to capture logic programs, its logical foundations have meanwhile been traced back to constructive logics.

This particular combination of different paradigms along with the aforementioned versatility made ASP a successful tool in AI research with a wide range of applications in academia as well as industry. Starting with an introduction to the essentials of ASP and its logical foundations, the special issue includes several articles on salient application areas of ASP. This is accompanied with interviews reflecting its upbringing from the early days of AI to modern off-the-shelf ASP engines. And last but not least, the special issue features several reports from the field.

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