

Editorial

Project Reports

Christian Igel¹

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Dear readers,

The KI journal offers a unique forum for presenting all aspects of artificial intelligence in various publication categories. I have the pleasure of being responsible for *project reports*, and on behalf of the editorial board I would hereby like to invite you to submit manuscripts falling

in this category. Project reports are a distinctive feature of our KI journal. As we have recently revised our guidelines for publishing articles in this category, I would therefore like to take the opportunity to elaborate on its aims and scope. Articles in this category should describe—not surprisingly—a research project. Although this is a fuzzy definition, this would typically mean a third-party-funded research project.

In the first place, *project reports* are about results and insights, though these need not necessarily be final outcomes. In addition, authors are encouraged to share any lessons learned about the planning, structuring, implementation, and coordination of their research project which would prove beneficial to others involved in similar initiatives. A *project report* specifies all persons and entities

that are/were involved in the project/initiative. It presents the motivation behind the project, explaining why it is interesting and important. It reviews the state-of-the-art in the field, and explains how the project/initiative goes beyond it.

The results presented in a manuscript will be evaluated using conventional scientific peer review by experts from the respective research areas. However, in contrast to articles in the category *technical contributions*, the results presented in a project report may have already been published elsewhere. A *project report* may summarize several articles published over a longer project period and put them into perspective. For example, a report may embrace a national or international collaborative research project (e.g., [1, 2]).

Project reports should be between four and six pages long. A common misunderstanding is that this means that research reports are simply short *technical contributions*. However, this is not the case. We welcome submissions to the *technical contributions* category with less than six pages.

The most important criterion for acceptance of a manuscript as a *project report* is, as for all other KI contributions, content that is of interest to our audience. The article should address readers that have a strong general background in artificial intelligence, yet may not be experts in the topic of the particular project.

So remember—*project reports* are the ideal way to summarise the results from your successful project(s) and to raise attention for your work. We look forward to many exciting submissions in this category.

Best wishes and enjoy reading this issue of KI,

Christian Igel

✉ Christian Igel
igel@di.ku.dk

¹ Department of Computer Science (DIKU), University of Copenhagen, 2100 Copenhagen Ø, Denmark

References

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1 Forthcoming Special Issues

1.1 Landmark-Based Navigation in Cognitive Systems

The importance of landmarks in human navigation has long been recognized in multiple fields. These include areas involved in the understanding, modelling and supporting wayfinding, spatial knowledge acquisition, and place recognition. From the psychological, linguistic and cognitive neuroscience viewpoint, the perceived landmark-ness of discrete objects vary among individuals. Thus, the key challenge lies in identifying those properties, which remain relevant across a wide range of individual differences, experiences, and behavioural patterns. From the computer science, artificial intelligence and cognitive modelling perspective, formalising these relations in a manner successfully matching the landmark's relevance for humans has proven difficult. Most recently, the increasing volume and accessibility of semantically rich geospatial data has opened new avenues for further progress in this area. The continuing collaboration between these fields is exemplified by the regular conference series on spatial information theory and geospatial science as well as multiple on-going interdisciplinary research projects.

In spite of that, technologies used to support human navigation struggle to incorporate the type of landmark information relevant for the human user. The gap between the human's and the computer's understanding of what constitutes a landmark remains one of the major challenges in the development of spatial systems intuitive in use as well as in modelling navigational behaviour similar to this of a human.

This special issue integrates theoretical, experimental and computational contributions from disciplines involved in the study of landmark-based navigation in cognitive

systems. The aim of the issue is to identify new areas for potential interdisciplinary collaboration and we invite applications focusing on, but not limited to, the following topics:

- Automatic, semi-automatic, and crowd-sourced detection of landmarks
- Modelling of landmark-based navigation
- Landmark knowledge acquisition and use
- Communication of landmark-ness
- Landmark-based approaches for indoor navigation
- Human-computer interaction with landmark-based systems
- Ubiquitous computing applications of the landmark concept.

Guest editors:

Prof. Dr. Angela Schwering

Dr. Jakub Krukar

Vanessa Joy Anacta

University of Münster, Germany

Institute for Geoinformatics

{schwering,krukar,v.anacta}@uni-muenster.de

1.2 Smart Environments

Smart environments aim to provide installations that support and enhance the abilities of humans in their regular life and possibly improve the environments themselves too, e.g., in terms of energy efficiency. Smart Environments are based on complex and distributed technical systems but they bear more challenges than the seamless composition of its components addressed in current research in technical disciplines. Setting technical challenges aside, providing intuitive interfaces to a system hidden in the environment and identifying means that allow the system automatically to provide suitable assistance for a wide range of every-day tasks involves several research questions.

Smart environments are best described as an active field of research spanning several disciplines, but particularly related to artificial intelligence and human-machine interaction. Since all applications penetrate our daily life with sensors, privacy becomes a central issue, too. This special issue aims at presenting a survey of the manifold AI-related research currently being performed, along with presentations of the projects and labs in which new ideas are conceived. Among the various disciplines involved, this issue addresses AI-related aspects and the interplay of AI and human-machine interaction, in particular AI techniques fostering new kinds of interaction, shedding some light onto questions such as:

- How can a ubiquitous system communicate its state of believe to a human?
- How can Smart Environments quickly comprehend a situation and user needs?
- How can a system adapt to users and how adaptive should it be?
- Which forms of knowledge representation help to form a shared mental model of system and user?
- How can user acceptance be measured efficiently and reliably?
- What are social and ethical implications of Smart Environments?
- Which are the most pressing use cases? What are their specific requirements?

Guest editors:

Prof. Dr. Diedrich Wolter

University of Bamberg, Germany
diedrich.wolter@uni-bamberg.de

Prof. Dr. Alexandra Kirsch

University of Tübingen, Germany
alexandra.kirsch@uni-tuebingen.de

1.3 Semantic Interpretation of Multi-Modal Human-Behaviour Data

This special issue of the KI journal focusses on and emphasises general methods and tools for activity and event-based semantic interpretation of multi-modal sensory data relevant to a range of application domains and problem contexts where interpreting human behaviour is central. The overall motivation and driving theme of the special issue pertains to AI-based methods and tools that may serve a foundational purpose toward the high-level semantic interpretation of large-scale, dynamic, multi-modal sensory data, or data streams. Data-sources that may be envisaged include

- Visuo-spatial imagery
- Movement and interaction data
- Neurophysiological and other human behaviour data.

Proposed foundational methods will, for instance, present the development of human-centred technologies and cognitive interaction systems aimed at assistance and empowerment, e.g. in everyday life and professional problem solving and creativity. This call particularly emphasises systematically formalised integrative AI methods and tools (e.g., combining reasoning and learning) that enable declarative modelling, reasoning and query answering, relational learning, embodied grounding and

simulation etc. Broadly, the role of declarative abstraction, knowledge representation and reasoning, and neural-symbolic learning and inference from multi-modal sensory data is highly welcome. For details, please refer to the full Call for Papers at <http://hcc.uni-bremen.de/calls/SpecialIssue-KI>, or contact one of the guest editors:

Prof. Dr. Mehul Bhatt

University of Bremen, Germany
bhatt@uni-bremen.de

Prof. Dr. Kristian Kersting

Technical University of Dortmund, Germany
kristian.kersting@cs.tu-dortmund.de

1.4 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.

If you are interested in contributing to this special issue, please contact one of the guest editors before the submission deadline of March 1, 2017:

Prof. Dr. Kristian Kersting

Technical University of Dortmund, Germany
Fakultät für Informatik
kristian.kersting@cs.tu-dortmund.de

Prof. Dr. Ulrich Meyer

Goethe Universität Frankfurt am Main, Germany
Institut für Informatik
umeyer@cs.uni-frankfurt.de