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## KI - Künstliche Intelligenz

German Journal on Artificial Intelligence - Organ des Fachbereichs "Künstliche Intelligenz" der Gesellschaft für Informatik e.V.

Managing editor: K.-D. Althoff

The Scientific journal "KI – Künstliche Intelligenz" is the official journal of the division for artificial intelligence within the "Gesellschaft für Informatik e.V." (GI) – the German Informatics Society – with contributions from throughout the field of artificial intelligence. The journal presents all relevant aspects of artificial intelligence – the fundamentals and tools, their use and adaptation for scientific purposes, and applications which are implemented using AI methods – and thus provides the reader with the latest developments in and well-founded background information on all relevant aspects of artificial intelligence. For all members of the AI community the journal provides quick access to current topics in the field and promotes vital interdisciplinary interchange.

### Preview:

#### 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 behavior 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.

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