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Editorial:

Special issue on artificial intelligence 2.0

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With the ever-growing popularization of the Internet, universal existence of sensors, emergence of big data, development of e-commerce, rise of the information community, and interconnection and fusion of data and knowledge in human society, physical space, and cyberspace, the information environment surrounding artificial intelligence (AI) development has changed profoundly, leading to a new evolutionary stage: AI 2.0. The emergence of new technologies also promotes AI to a new stage (Pan, 2016).

The next-generation AI, namely AI 2.0, is a more explainable, robust, open, and general AI with the following attractive merits: It effectively integrates data-driven machine learning approaches (bottom-up) with knowledge-guided methods (top-down). In addition, it can employ data with different modalities (e.g., visual, auditory, and natural language processing) to perform cross-media learning and inference. Furthermore, there will be a step from the pursuit of an intelligent machine to the hybrid-augmented intelligence (i.e., high-level man-machine collaboration and fusion). AI 2.0 will also promote crowd-based intelligence and autonomous-intelligent systems.

In the next decades, AI2.0 will probably achieve remarkable progress in aforementioned trends, and therefore significantly change our cities, products, services, economics, environments, even how we advance our society.

This special issue aims at reporting recent re-thinking of AI 2.0 from aforementioned aspects as well as practical methodologies, efficient implementations, and applications of AI 2.0.

The papers in this special issue can be categorized into two groups. The first group consists of six review papers and the second group five research papers.

In the first group, Zhuang *et al.* (2017) reviewed recent emerging theoretical and technological advances of AI in big data settings. The authors concluded that integrating data-driven machine learning with human knowledge (common priors or implicit intuitions) can effectively lead to explainable, robust, and general AI.

Li W *et al.* (2017) described the concepts of crowd intelligence, and explained its relationship to the existing related concepts, e.g., crowdsourcing and human computation. In addition, the authors introduced four categories of representative crowd intelligence platforms.

Peng *et al.* (2017) presented approaches, advances, and future directions in cross-media analysis and reasoning. This paper covers cross-media representation, mining, reasoning, and cross-media knowledge evolution.

Tian *et al.* (2017) reviewed the state-of-the-art research of the perception in terms of visual perception, auditory perception, and speech perception. It also covered perceptual information processing and learning engines.

Zhang *et al.* (2017) introduced the trends in the development of intelligent unmanned autonomous systems. It covered unmanned vehicles, unmanned aerial vehicles, service robots, space robots, marine robots, and unmanned

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workshops/intelligent plants.

Li BH *et al.* (2017a) presented the recent advances of intelligent manufacturing based on the integration of AI technology with information communications, manufacturing, and related product technology.

In the second group, Zhou *et al.* (2017) proposed an approach to effectively disentangle the discriminative features in the manner of collaborative utilization of collective wisdom (via human-labeled crowd labels) and deep learning (via human-generated data) for the named entity disambiguation.

Liang *et al.* (2017) devised a general and useful model that considers not only the arrangement of a set of tasks to a set of crowd workers, but also all the dynamic arrivals of all crowd workers.

Xue *et al.* (2017) proposed a vision-centered multi-sensor fusing framework for a traffic environment perception approach to autonomous driving, which fuses camera, LIDAR, and GIS information consistently via both geometrical and semantic constraints for efficient self-localization and obstacle perception.

Fang *et al.* (2017) devised a model to build up task-oriented collaborative capabilities for coalition formation in multi-agent systems.

Li BH *et al.* (2017b) presented a swarm intelligence design technology based on a workshop of meta-synthetic engineering, including architecture, meta-synthetic workshop process, and design resource delivery technology.

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