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AI and CI



Currently Artificial Intelligence (AI) is having a big boom. One of AI's core technologies is deep learning, which is clearly Computational Intelligence (CI). In this sense, the current AI boom is actually a CI boom too. However, applications with deep learnings are rarely referred to as CI. They are almost always referred to as AI. High popularity of AI can be shown in various manners. If you visit the IEEE Xplore website, you will see the following three lists: just published journal issues, most popular articles, and popular search terms. The top three popular search terms were “IoT”, “machine learning”, and “artificial intelligence” when I checked them in April 2019. This shows the popularity of AI including machine learning. It seems that many users of the IEEE Xplore are trying to search for AI papers using “machine learning” and “artificial intelligence” as search terms without knowing that some or most of them are CI related papers.

Each journal page in the IEEE Xplore has similar lists. In the CIM page, the top three popular articles based on the number of monthly downloads were “Recent trends in deep learning based natural language processing”, “Time series prediction using support vector machines: A survey”, and “Evolutionary fuzzy systems for explainable artificial intelligence: Why, when, what for, and where to?” This list also shows the high popularity of AI especially with the first paper that was also included in the top 100 popular articles list among all of the papers in the IEEE Xplore. Currently, AI papers seem to receive much more attention than CI papers. However, as I have explained, the core technology in the current AI boom is CI. You may have the following question: Is CI a subset of AI?

When I started my CI research more than 30 years ago, AI and CI were clearly different with no overlap in my understanding. In the first WCCI conference in 1994, CI was explained as a research field between AI and BI (Biological Intelligence) where CI was based on the three areas: neural networks, fuzzy systems, and evolutionary computation. The binding among the three areas under the CI umbrella has not been strong. They have been developed separately. For example, in Japan, each of the three areas has its own society. We also have Japan AI society whereas we do not have Japan CI society. Currently, a large number of deep learning papers are presented at AI conferences all over the world. The presence of neural networks in AI has drastically increased in the last few years. As CI researchers, we may have at least two strategies: One is to increase the presence of CI as a subset of AI to exploit the current AI boom, and the other is to establish a strong presence of CI outside AI to prepare for the end of the AI boom. What is your strategy?

The feature topic of the current CIM issue is “Deep Reinforcement Learning and Games.” This can be viewed as an AI special issue as well as a CI special issue. I hope you will enjoy all articles in this issue.

Hisao Ishibuchi

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