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**Review on deep-learning-based cognitive computing.** (Chinese. English summary)

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Summary: With the advent of the era of big data and artificial intelligence, the research focus of machine learning has shifted from perception domain to cognitive computing (CC) domain. How to improve the cognitive ability through big data is becoming a research hotspot of intelligence science and technology, in which recent deep learning has been expected to spark a new wave of research on cognitive computing. This paper summarizes the research progress of cognitive computing based on deep learning in recent years. And, comparison and analysis of recent progress in deep learning and cognitive computing are presented from three aspects, that is, deep learning data representation, cognitive models, parallel computing and its applications in the big data environment. Finally, some challenges and development trends of cognitive computing based on deep learning for big data are investigated to forecast the future research.

**MSC:**

68T05 Learning and adaptive systems in artificial intelligence

**Keywords:**

deep learning; cognitive computing; tensor data representation; parallel computing; big data

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