

# Towards Brain-inspired Web Intelligence and Applications

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## SUMMARY

Artificial Intelligence (AI) has been mainly studied within the realm of computer based technologies. Various computational models and knowledge based systems have been developed for automated reasoning, learning, and problem-solving. However, there still exist several grand challenges. The AI research has not produced major breakthrough recently due to a lack of understanding of human brains and natural intelligence. In addition, most of the AI models and systems will not work well when dealing with large-scale, dynamically changing, open and distributed information sources at a Web scale.

The next major advances in artificial intelligence and Web intelligence are most likely to be brought by an in-depth understanding of human intelligence and its application in the design and implementation of systems with human-level intelligence.

To prepare us ready for the great opportunity, this talk outlines a unified framework for the study of brain inspired Web intelligence (WI) by exploring the latest results from brain informatics (BI). This leads to profound advances in the analysis and understanding of data, knowledge, intelligence and wisdom, as well as their inter-relationships, organization and creation process. The fast-evolving WI research and development initiatives are now moving towards understanding the multi-facet nature of intelligence in depth and incorporating it on a Web scale. The recently developed instrumentation (fMRI etc.) and advanced IT are causing an impending revolution in WI research and development, making it possible for us to pursue the new frontier of intelligence science and develop human-level Web intelligence.

## BIOGRAPHY

Ning Zhong received the Ph.D. degree in the Interdisciplinary Course on Advanced Science and Technology from the University of Tokyo. He is currently head of Knowledge Information Systems Laboratory, and a professor in Department of Life Science and Informatics at Maebashi Institute of Technology, Japan. He is also director and an adjunct professor in the International WIC Institute (WICI), Beijing University of Technology. He has conducted research in the areas of knowledge discovery and data mining, rough sets and granular-soft computing, Web intelligence, intelligent agents, brain informatics, and knowledge information systems, with over 200 journal and conference publications and 20 books. He is the editor-in-chief of the Web Intelligence and Agent Systems journal (IOS Press), associate editor of IEEE Transactions on Knowledge and Data Engineering, and the Knowledge and Information Systems journal (Springer), a member of the editorial board of Transactions on Rough Sets (Springer), and the

editorial board of Advanced Information and Knowledge Processing (AI&KP) book series (Springer), Frontiers in AI and Applications book series (IOS Press), Chapman&Hall/CRC Data Mining and Knowledge Discovery book series, and editor (the area of intelligent systems) of the Encyclopedia of Computer Science and Engineering (Wiley). He is the co-chair of Web Intelligence Consortium (WIC), chair of the IEEE Computer Society Technical Committee on Intelligent Informatics (TCII), member of the steering committee of IEEE International Conferences on Data Mining (ICDM), vice chair of IEEE Computational Intelligence Society Technical Committee on Granular Computing, the steering committee of International Rough Set Society. He has served or is currently serving on the program committees of over 100 international conferences and workshops, including IEEE ICDM'02 (conference chair), IEEE ICDM'06 (program chair), IEEE/WIC WI-IAT'03 (conference chair), IEEE/WIC/ACM WI-IAT'04 (program chair), and IJCAI'03 (advisory committee member). He was awarded the best paper awards of AMT'06, JSAI'03, IEEE TCCI/ICDM Outstanding Service Award in 2004, and Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD) Most Influential Paper Award (1999-2008).