

Laudatio for Prof. Bo Zhang:

Prof. Bo Zhang is a chair professor of Tsinghua University, the top-ranked university of China and a lifelong Academician of the Chinese Academy of Sciences. He is a brilliant first-generation scientist of intelligent computation in China and has contributed significant pioneering research to numerous related topics. He is one of those Chinese researchers who very early on have worked at an international level at top universities in both China and the USA.

As early as the late 1970s, he established the first lab of artificial intelligence in China, and later helped to build the State Key Lab of Intelligent Technology and Systems, which he headed from 1991 to 1996. He founded the center for neural and cognitive computation and the research group on multimedia information processing at Tsinghua University. This group has achieved very important results in machine learning, image and video analysis and retrieval. In addition, the high impact of Prof. Bo Zhang on the field is impressively reflected by the careers of his over 70 PhD students, many of whom have become active international researchers at the professorial level or hold leading scientific positions in large companies like Microsoft, Google, Baidu, Sohu or Yahoo.

His more than 150 papers and three monographs receive citations in the three-digit range and cover a wide range of topics, such as geometric motion planning algorithms in robotics, heuristic and statistical search methods, scheduling algorithms, neural network approaches, kernel methods, multi-media information retrieval and many more.

He has presented the quotient space theory of problem solving in artificial intelligence which is based on the quotient space mathematical model, the discussion of transformation, composition and reasoning methods among multi-granular spaces. Bo Zhang's adoption greatly benefits hierarchical problem solving by reducing the computational complexity.

In the nineties, he complemented these lines of research with neural networks, analyzing complexity issues, application scenarios and connections with cognitive science. His quotient space theory has become one of the main branches in granular computing and has been applied to a wide range of areas, such as the statistical heuristic search, topological dimension reduction based path planning, relation matrix based temporal planning, and multi-granular information fusion methods.

In artificial neural networks, he introduced a novel and very effective method for facilitating the training of multilayer perceptrons by exploiting point-set cover algorithms to prestructure the network interconnectivity in a principled fashion. The resulting top-down structural learning algorithms are in several aspects greatly superior to the traditional purely gradient-based ones.

Currently, he is very active in multimedia retrieval methods, developing efficient methods for relevance feedback and for region-based image and video retrieval. His more recent works delve deeply into statistical methods, with a variety of application domains ranging from signal processing to image analysis and automatic web data extraction.

His successful work over 50 years earned Prof. Bo Zhang numerous awards, including the ICL European Artificial Intelligence Prize 1984 and the promotion to a life-long fellow of the Chinese Academy of Sciences in 1995. For his outstanding teaching career, Bo Zhang has received the top award for excellent teachers in China.

With his topic of multimodal information processing he has contributed to the research focus multimodality at the Department of Informatics of the University of Hamburg. He has provided valuable advice to the professors of Informatics and the colleagues at the UKE and the Department of Psychology of the University of Hamburg. With his help, the cooperation between the University

of Hamburg and Tsinghua University could involve the top professors of Tsinghua University most active in research in the field of cognitive systems. The field of multimodal cognitive systems is a long-term focus of the Department of Informatics and also a strategic focus of our university.

Prof. Bo Zhang is a very eminent researcher with superior qualifications and an exceptional scientific standing. He has always embraced new ideas and promoted innovation in China and internationally. Therefore, we consider him a splendid candidate for the award of the honorary doctorate degree of the Department of Informatics at Hamburg University.