The Institute of Computer Science and Technology at Peking University

The Institute of Computer Science and Technology (ICST) was established in 1983 by professor WANG Xuan, the winner of the Top National Science and Technology Award in 2001.

ICST has made significant contributions to computer science and technologies by advancing applications in printing and media industries. Specifically, the Laser Typesetting System, adopted by more than eighty percent of Chinese newspaper publishers, has led a nationwide revolution; the Newspaper Digital Asset Management System has created a paperless working environment for the media industry; the Digital Rights Management System has promoted the popularity of e-books; and the Digital Broadcast Control System has made digital TV automation possible.

Expanding the scope from digital to intelligent media, ICST is dedicated to the research of media intelligence. The important progress achieved recently includes cross-modal content recognition, machine writing, and automatic generation of Chinese fonts.

Prof. Xiaojun Wan specializes in natural language generation and machine writing. His team invented a series of text summarization methods to automatically generate news reports. Their innovative technologies have been transferred into several online AI reporters (e.g., Xiaomingbot and XiaoNan) in various domains, including sports and lifestyles. For instance, Xiaomingbot published more than ten thousand news articles for Rio 2016, Football League and NBA events.

Prof. Yuxin Peng, has led his team to achieve several important breakthroughs on cross-modal content analysis and recognition. They proposed spatial topology based attention learning, which for the first time solved the difficult problem of fine-grained image classification without object annotation. They also proposed collaborative learning of spatial-temporal attention to achieve the video recognition accuracy of 95.7%, and won first place six times in video instance search of International evaluation campaign TRECVID. The graph regularized shared semantic space projection they proposed, for the first time broke through cross-modal retrieval up to 5 modal types including image, video, audio, text and 3D model. Their research achievements have been successfully applied to over 100 organizations, and gained first prize of Beijing Science and Technology Award in 2016.

The group headed by Professor Zhouhui Lian, and previously headed by Professor Jianguo Xiao, has been working for decades to advance the design and production of Chinese fonts. Adopting state-of-the-art CG/AI/CV techniques, they have proposed a series of solutions significantly improving the designing/producing efficiency of high-quality printing/compressed/colorful Chinese fonts. The group was also the first to make possible the automatic generation of practical handwriting fonts with arbitrarily large numbers of Chinese characters. Their techniques have been authorized and transferred into commercial products for hundreds of millions of users, producing great commercial benefits and significant social impact.

The Institute welcomes applications from top researchers and, in particular, young talents from around the world. Feel free to contact us:

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Intelligent Control of Networked Dynamical Systems at Peking University

With the dramatic development of multiple robot systems, intelligent traffic systems, Internet of Things (IoT), smart grids, and mobile sensor networks in the last decade, classic control theory is no longer adequate. A new design theory and control methods are needed to deal with such distributed systems, each of which is typically composed of many subsystems connected as a large network.

Long Wang, a Cheung Kong Chair Professor of Dynamics and Control, has spearheaded a series of pioneering programs by using Evolutionary Game Theory (EGT), which is powerful in solving the competing interactions among different agents. Some fundamental studies include when the popular embedded Markov chain method is valid, the intrinsic differences between the two widely used evolutionary rules, and what is the asymptotic behavior of mobile agents. Professor Wang and his colleagues have found a simple yet effective control protocol to make all agents coordinate with each other, which has proven to be efficient and energy-saving over a wide range of network structures. In addition, they have also been successful in studying the emergent mechanism of human intelligent behaviors, which is fundamental to artificial intelligence. These novel and insightful theoretical results have successfully found their applications in the coordination and control of multiple mobile robots.

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