**Dr. Du Zang - i2Learning: Perpetual Learning through Overcoming Inconsistencies**

How to develop intelligent agent systems that can automatically and incrementally improve their problem solving performance over time through perpetual learning is a challenging research topic.

The state-of-the-practice in the field of machine learning thus far is still dominated by the one-time learner paradigm: some learning algorithm is utilized on data sets to produce a model or a target function, and then the algorithm is put away and the model or the function is put to work. Such a learn-once-apply-next (LOAN) approach is not adequate in dealing with many real world problems and is in sharp contrast with the human life-long and continuous learning process. Another dimension in perpetual learning that has been largely overlooked is what types of events or stimuli trigger an agent to be engaged in the continuous learning episodes. Inconsistencies in data, information, knowledge, or meta-knowledge can be a very useful and important type of learning stimuli. In this talk, we describe an inconsistency-induced learning framework called i2Learning for perpetual learning agents.

The i2Learning framework has the following characteristics: (1) the learning episodes of an agent are triggered by inconsistencies it encounters during its problem-solving episodes; (2) the perpetual learning process is embodied in the continuous knowledge refinement and augmentation so as to overcome encountered inconsistencies; (3) each learning episode results in incremental improvement of the agent’s problem solving performance; and (4) i2Learning is an overarching structure that accommodates the growth and expansion of various inconsistency-specific learning heuristics and strategies.

Using mutually exclusive inconsistency and inheritance inconsistency as two examples, we explain how i2Learning facilitates learning through bias shifting and learning through Pearl’s ε-semantics, respectively.

**Dr. Du Zhang** received his Ph.D. degree in computer science from the University of Illinois, and his MS and BS degrees in computer science from Nanjing University, China. He is a Professor of the Computer Science Department at California State University, Sacramento.

His current research interests include: inconsistency-induced perpetual learning, machine learning applications in software engineering, and utility of inconsistencies in knowledge, information and big data. He has authored or coauthored over 160 publications in journals, conference proceedings, and book chapters, in these and other areas. In addition, he has edited or co-edited twelve books and conference proceedings. Since 2003, he has served as conference general chair, program committee chair, program committee co-chair, or program vice chair/area chair for 25 international conferences, most of which are IEEE sponsored international conferences. Currently, he is an Associate Editor for *International Journal on* *Artificial Intelligence Tools*, an Area Editor for *International Journal of Software* *Engineering and Knowledge Engineering*, a member of editorial board for *Journal of Big* *Data*, a member of editorial board for *International Journal of Cognitive Informatics and* *Natural Intelligence*, a member of editorial board for *International Journal of Software* *Science and Computational Intelligence*, and a member of editorial board of *Journal of* *Advanced Mathematics and Applications*. In addition, he has served as a guest editor for special issues of *Software Quality Journal*, *IEEE Transactions on SMC*-Part B, *EATCS* *Fundamenta Informaticae*, *International Journal of Semantic Computing*, and *International* *Journal of Computer Applications in Technology*. Du Zhang is a senior member of IEEE and a senior member of ACM.