UCF DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCEINCE

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Presented by the CS Division

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BIOGRAPHY

Guo-Jun Qi receives his Ph.D. from the University of Illinois at Urbana-Champaign. He has wide range of research interests in extreme data exploratory and analytics, including processing and analyzing large-scale data, information and knowledge. Specifically, his current research interests lie on building highly reliable information systems, with the help of collective data and knowledge from crowdsourcing, multi-source sensing and social media to solve complex computing tasks in real world. He was the recipient of Microsoft Fellowship, and twice IBM Fellowships. His researches have appeared in a wide range of venues, such as Proceedings of IEEE, IEEE T PAMI, IEEE T KDE, WWW, ICML, CVPR, ACM MM, ICDM, SDM and ICDE. Among them include the best paper of ACM Multimedia 2007, as well as the chosen paper in the issue of IEEE T KDE for the best ICDE 2013 papers. His research has been supported by a lot of external government and industry sponsors, including NSF, ARL, ONR, HP, Microsoft, and IBM.

CROWDSOURCING COMPUTING TASKS TO PEOPLE: FROM ESP GAME TO SOCIAL MEDIA

WEDNESDAY MARCH 26, 2014

10AM—HEC 450

Crowdsourcing complex computing tasks to people has become a promising way to leverage human perception power to solve difficult computer intelligence problems, from labeling images and documents, improving web searching results, finding the unknown galaxies in deep space, to fold 3D protein structure. Accordingly, many human-centric computing algorithms and platforms have been designed to accommodate different crowdsourcing tasks, such as ESP game, Amazon Mechanical Turk (AMT), and social media like Flickr and Twitter. In these systems, people are contributing their brain powers to crowdsourcing for different reasons, for entertainment (e.g., ESP game), monetary incentives (e.g., AMT), or even autonomously (e.g., in social media).

In particular, in this talk I will address data analytics problem for building reliable crowdsourcing systems. For this purpose, as a unified crowdsourcing abstract, I build a Multiple Source Sensing (MSS) model, in which task participants are treated as sensors and their contributions as sensed data on a set of objects related with crowdsourced tasks. Based upon this MSS model, I compare different crowdsourcing paradigms, and reveal the key factors -- the reliability of people, their interdependence, and the varying levels of task difficulties --, which impact the success of a crowdsourcing system. I will comprehensively study these factors and extract high quality data by aggregating collective knowledge, even if the participants are not always reliable or independent in completing their tasks. Efficient algorithm is derived to infer the most likely true answers by taking into account the interdependence between participants given the massive crowdsourced data of deficient quality.

I will also present my recent progress towards a decentralized crowdsourcing system with localized data storages. This system assumes the participants form a connected network (e.g., a social network), where they only exchange knowledge with the trusted friends of their neighbor nodes. In this system, each information source (e.g., a task participant) optimizes his/her own estimates of the true answers in parallel. Through several passes of local information exchange between neighbors, each source aggregates the information spread from the other sources across the whole network, and all sources eventually reach consensus decision for each task by following a set of local consistency constraints.

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