

# 『清华信息大讲堂第101讲-三星第5讲』



- **报告题目:** Emerging Opportunities with Smartphones: Crowdsourcing and Unobservable Active Authentication
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## 摘要:

More and more people are adapting to smartphones, which are lightweight and provide extensive communication, computation, and sensing capabilities. These features make smart phones ideal for crowdsourcing, which is a new computing paradigm for human centric computing with collective intelligence. There are two challenges in crowdsourcing to smartphones. The first challenge is the need for an appropriate incentive mechanism, which can provide incentives for smart phone users to participate in crowdsourcing. The second challenge is active authentication of the user. To address the first challenge, we design incentive mechanisms for mobile phone sensing. We consider two system models: the platform-centric model where the platform provides a reward shared by participating users, and the user-centric model where users have more control over the payment they will receive. For the platform-centric model, we design an incentive mechanism using a Stackelberg game, where the platform is the leader while the users are the followers. We show how to compute the unique Stackelberg Equilibrium, at which the utility of the platform is maximized. For the user-centric model, we design an auction-based incentive mechanism, which is computationally efficient, individually rational, profitable, and truthful. To address the second challenge, we design a biometric based un-observable active authentication scheme for smartphones. Our scheme uses the sensors within the smartphones to capture the gestures of finger movement of the user of the smart phone. These gestures are used to decide whether the current user of the smart phone is the owner of the smart phone or not. Besides discussing what we know, this talk will also address several important open research issues in this area.

## 简介:

Guoliang Xue is a Professor of Computer Science and Engineering at Arizona State University. He earned a PhD degree in Computer Science in 1991 from the University of Minnesota, USA. He earned the BS and MS degrees in 1981 and 1984, respectively, from Qufu Normal University, China. His research interests include survivability and security issues in networking, quality of service provisioning, and human centric computing with collective intelligence. He has published over 200 refereed technical papers, many of which appeared in top journals such as IEEE/ACM Transactions on Networking, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Mobile Computing, and top conferences such as ICNP, INFOCOM, MOBICOM, MOBIHOC, and NDSS. Guoliang received Best Paper Awards at ICC' 2012, GLOBECOM' 2011, ICC' 2011, and MASS' 2011, as well as a Best Paper Runner-up Award at ICNP' 2010. He was a Keynote Speaker at LCN' 2011-IEEE Conference on Local Computer Networks. He serves on the editorial boards of IEEE/ACM Transactions on Networking and IEEE Network Magazine. He served as an associate editor and advisory board member of IEEE Transactions on Wireless Communications. He was a TPC co-chair of IEEE INFOCOM' 2010 and is a member of the INFOCOM Standing Committee. He was an IEEE Communications Society Distinguished Lecturer from January 2010 to December 2011. He is an IEEE Fellow. He is a candidate for IEEE Communications Society VP-Conferences in the 2013 election.

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