Personal Statement

Yongsen MA

I am Yongsen MA from Shanghai Jiao Tong University and I am applying a PhD program on wireless networking at CSE, HKUST. My interest in wireless networks was first aroused during my undergraduate studies in Shandong University that I chose the final year research project on performance evaluation of Zigbee networks based on NS2. During my research I built up the simulation model and evaluation scripts written in `tcl` and `awk` respectively. The thesis scored 96/100 in the graduation defence and helps me better understand the wireless protocol and network simulator. Since that time, I have been working on wireless communications which helps me gain practical experience on programming, simulations and experiments.

My graduate research at the Center for Intelligent Wireless Networking and Cooperative Control (i-WiNC2) reinforced my interest in wireless networking and mobile computing, especially on the link quality measurement and modeling in mobile networks. I developed two performance measurement platforms separately for GSM/GSM-R and 802.11n covering wireless cellular networks and WLANs. The first platform is designed for Um interference monitoring in GSM/GSM-R, which is written in C# based on Microsoft .NET Compact Framework and tested along Beijing-Shanghai high-speed railway. For MIMO-OFDM WLANs of 802.11n, I developed the link quality measurement software written in Linux C based on Atheros wireless driver `ath9k` and Linux wireless extension. Except for software development, I am also specialized in web design and all the related information, documents and source code can be found at my website: http://yongsen.github.com. These experiences helped me to develop relevant skills in programming, open source coding, wireless networking and mobile computing.

Based on these two platforms, I have written four papers, three patents and one report on channel state estimation and link quality measurement. On the physical layer, I written the paper on dynamic estimation of Rician fading channels in GSM-R networks. It introduces the dynamic EM estimation algorithm to reduce the measurement overhead and be adaptive to different propagation environments with guaranteed accuracy. This paper has been published in WCSP'12, and the journal vision is under review of Springer Wireless Networks. I have also authored three patents and owned one software copyright. For the link quality measurement, I have written the paper of packet delivery measurement and prediction in mobile 802.11n networks. This paper presents the online packet delivery modeling framework, which incorporates a novel design by exploiting both packet-level and physical-level metrics, along with the diversity property of multi-configuration simultaneously. This online framework also strikes a balance between the measurement overhead and accuracy. These experiences strengthen my ability in constructing questionnaires and writing succinctly.

Additionally, I also participate in research projects including proposals, reports and deliverables. I was responsible for system design, experiments of the Key Project of Ministry of Railway, and written a research report and user manual on it. I also participant in discussions of NSFC projects including dynamic spectrum auction in cognitive radio and demand response in smart grid. Besides, I have the opportunity to participate in conference and journal papers reviewing, mainly including IEEE Infocom, IEEE Globecom, and Springer Wireless Networks. As the instructor of PRP (Participation in Research Program) for undergraduate students, I am responsible for directing students on software developing and thesis writing including a paper on dual-antenna based handover scheme for GSM-R network which is presented in WCSP'12 as well. All these positive research experiences equipped me with additional skills to have a better sense of academical and technical problems.

Currently, I am working on the energy-efficient rate adaption in 802.11n networks, seeking the suitable trade-off between data rate and packet delivery under the constraints of energy consumption. I hope to carry on the related researches including energy-efficient algorithm and cross-layer protocol in MIMO-OFDM systems in the near future. This, along with my thesis advisor and members of i-WiNC2, has motivated me to continue into a Doctoral program in wireless networking.

my research experience strong my ability in publishing, and makes me enthusiastic,