Intel-NTU Digital Health Project

1st Quarterly Report (8/1/2008 ~ 10/31/2008)

Tim Chou, Hao-hua Chu, Li-chen Fu, Jane Hsu, Polly Huang, Yi-ping Hung, Bob Wang (in alphabetical order)
National Taiwan University

Summary of the administrative activities in the first quarter:

- Jane, Hao and Prof. Hung attended the Intel IDF Asia Academic Forum 2008 on November 20 and 21, 2008. It was a wonderful forum organized by Rachel in the Sheraton Hotel Taipei. We are very happy that one of our projects won the best research award. We presented our work to many senior Intel R&D managers, including Kevin Kahn (senior fellow), Herman D’Hooge (Innovation Strategist), and others. We have received lots of wonderful feedbacks and encouragement.

- We were encouraged by Dr. Andrew Chien’s (Intel research director & VP) talk on “Essential computing”, whose theme is highly related to the research topics and technologies explored in our projects. Jane introduced some of our projects to Dr. Chien on November 23, 2008. We have been encouraged to approach Intel research Seattle on exploring potential collaboration.

Summary of the research activities this quarter:

- **[Playful Bottle (Health)].** This is the mobile phone extension of the Mug-forest project last year, whose goal is to encourage office workers to develop regular water drinking habit. On the technology side, it uses the sensors (i.e., camera and accelerometer) available on a mobile phone (attached to the drinking bottle) to detect the water level in a water-drinking bottle. This water level information is used to play a multi-user game, in which people can see each other’s water drink levels in the form of hydrated/dehydrated trees. Then, people can send each other “loving hearts” reminder to drink water. We have conducted 10-users study in the last quarter on our playful bottle. Our results show that people responded faster to the social reminder (loving hearts from friends) than system reminder (dehydrated trees). We have submitted a paper to ACM CHI 2009.

- **[Zero Carbon City Guide (Green)].** We have started the “CPS bicycle” project whose goal is to promote the use of bicycle as the green/healthy/low-cost transportation choice in Taipei city. On the sensing part, this smart bicycle would be equipped with various sensors (some are built-in sensors to a mobile phone carried by a cyclist, other are additional sensors attached to the bicycle) to detect road surface condition, path continuity, the travel level, the noise level, etc. Such information would be used to construct a virtual city map with bike-friendliness labels. On the interaction part, a cyclist can use this virtual bike-friendliness map for navigation. This information can also be communicated to the Taipei city administrator on how to improve the city infrastructure for cyclists.

- **[Zero Carbon City Guide (Green)].** It is estimated that over 70% of the sixty thousand licensed taxis in the Greater Taipei area are running without passengers. On the other hand, requests from customers are not always met in a timely manner. To reduce the fuel waste due to taxis circling the streets in search of passengers and to improve customer satisfaction, we apply spatial analysis, data mining and clustering algorithm on historical data of taxi requests, and design a context-aware taxi demand prediction system to suggest potential “hot spots” so the taxi drivers can make good decisions on where to find the next customer. The initial results will be published in the 2008 Conference on Artificial Intelligence and
Applications. The paper is nominated as a candidate for the best paper award of TAAI 2008.

- **SpinLoc localization** Polly will present our paper in ACM Sensys (the most prestigious research forum in sensor networking) in Charlotte, North Carolina. Two other students, Ben and Ted, will also attend the conference.