

Final-Year Project Proposal for 2008/09

1. Smart Learning System for School Field Trips

- the Smart Learning System is a generic and intelligent system that will help primary or secondary school students to explore and learn more about the different varieties of animals/plants from their field trips in some visitors' center (such as the Lions Nature Education Center at Sai Kung);
- students can use 3G mobile phones/devices to take pictures of animals/plants labeled with QR-codes (i.e. sth. like 2D bar-codes with wide applicability in Japan);
- after the concerned QR-codes are decoded, the data for the specimen will be sent to the back-end database (DB) server via WiFi network to search for more useful info. about the specific animals/plants;
- the searched info. will immediately be displayed on the mobile phones/devices to enrich the users' experience and knowledge so as to ensure the field trips as "fruitful" as possible.

** This project will be working closely with the IT in Education unit of the Education Bureau (EDB) to investigate about their existing system as a reference, and exchange experiences with the EDB for any possible system extension(s).

2. LEGO MindStorms & Application Development for Coordinated Tasks (1 student)

- the student can learn to use programming toolkits or other available development software to build useful applications for LEGO MindStorms, i.e. a very popular robotic toolkits worldwide, to perform some coordinated task (such as playing xylophones or symphony music) to demonstrate the flexibility and programmability of the toolkit;
- the programming toolkit provides a low-level C-like syntax as well as the windows-based GUI for programming. However, as the involved task is sophisticated, the student will be expected to use C-like programming language to develop the application;
- there will be regular meetings set up with the student to review his/her progress.

** This project may possibly have some collaboration with other relevant projects under Dr. E. Lam & Dr. K.S. Lui. Thus, the student should be prepared to work with a team, with each project scope clearly defined and working independently.

3. Gesture Input for Human-Computer Interaction

- Basically, gesture based input is an interesting topic in Human-Computer Interaction (HCI);
- the student will try to integrate the LEGO MindStorms toolkit with that of the Wii(TM) sensing device to build useful gesture-based applications for LEGO MindStorms, i.e. a very popular robotic toolkits worldwide, to perform some coordinated task (such as playing xylophones or symphony music);
- the emphasis of this project is more on capturing the gesture inputs from the Wii "sensing device" and then providing the appropriate commands to control the LEGO MindStorms robots to perform some coordinated task;
- the deliverable of this project should be a workable system that can be demonstrated in the class of HCI;
- there will be regular meetings set up with the student to review his/her progress.

** This project may possibly have some collaboration with other relevant projects under Dr. E. Lam & Dr. K.S. Lui. Thus, the student should be prepared to work with a team, with each project scope clearly defined and working independently.

4. Monitoring Workflow Efficiency Through ZigBee & QR codes

- The ZigBee is the de facto standard of wireless networks for industrial application;
- This project is essentially an extension of a previous project, in which we Uses sensors and the ZigBee network to monitor & communicate about the machine operations;
- QR codes will be employed to encode/decode the process or part ID involved in various manufacturing processes;
- Besides, new features will be added to enhance the developed monitoring software.

5. Using Web 2.0 to Build a Generic Social Networking System

- In this project, we aim to build a generic social networking system using the well-known Web 2.0 technologies such as the AJAX standing for the Asynchronous JAVaScript and XML ;
- the system should focus more on the essential features for social networking such as defining groups, and intra-group communication methods, etc.

- The targeted system should provide Web-based interface for end-users to communicate with various groups of interests, and also the admin. portal for the system administrator to monitor the activities of different social groups. It should be useful in many general-purpose and social-group oriented application such as the Alumni systems.

6. Developing A Mobile Learning System for UMPCs

- the market of Ultra Mobile PCs (UMPCs) such as the Samsung Q1 or htc is becoming more promising with more killer applications expecting to be built for which mobile learning systems will surely become the new wave of killer applications;
- Two major O.S. platforms, including the Windows-based and Linux-based, exist for UMPCs nowadays.
- In this project, we aim to build a flexible mobile learning system that can work across the two O.S. platform, i.e. platform-independent, for students to learn English (or other languages such as Chinese);