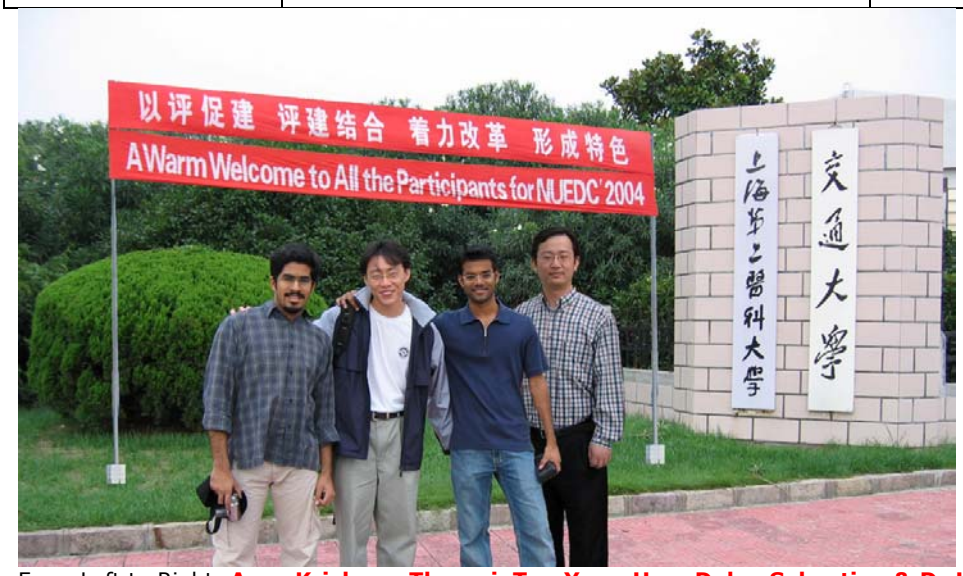
Write-Up for the NUEDC 2004

The biannual National Undergraduate Embedded Design Contest (NUEDC) was held at **Shanghai Jiao Tong University in China** on 12-19 September 2004. There were more than 90 teams from almost all the premier PRC universities (such as Tsinghua University, Beijing University and Fudan University). The teams were given four months to propose and implement ingenious ideas, with the embedded-systems applications pushing the technological boundaries of the processors.

Two teams of ECE students (under the supervision of **Dr Ha Yajun**) represented **National University of Singapore** at the competition. After many rounds of intense selections, prizes were awarded to a few of the top participating teams including both NUS teams which received the following prizes:

Prize	**Title of Project**	**Team Members**
2nd Class Honours prize	Video VoIP Phone that Seamlessly Switches between Bluetooth & Wi-Fi	Krishnan Thampi, Tan Yung Han and Daley Sebastian
3rd Class Honours prize	Doctor's Assistant	Ng Jia Hui



From Left to Right: **Arun Krishnan Thampi, Tan Yung Han, Daley Sebastian & Dr Ha Yajun**

The winning design of Arun, Yung Han and Daley, "**Video VoIP Phone that Seamlessly Switches between Bluetooth & Wi-Fi**", demonstrates the concept of a Voice over IP (VoIP) based video phone (using the Intel Sitsang Board) that can seamlessly switch between two given services – say GPRS, Wi-Fi or a Bluetooth network and Wi-Fi. The project realizes seamless switching of voice/video conversations between a Wi-Fi network and a Bluetooth service offered by a Bluetooth Network Access Point (NAP). VoIP is

a mode of Internet Telephony which is much cheaper than the telephone network. Such an application which seamlessly switches between Bluetooth and Wi-Fi or any other type of services is currently not available in the market and hence makes it has commercial potential. If a NAP is found, Wi-Fi will be used by the device. But if the device goes out of range of the NAP, then the switching to Bluetooth takes place. The Video phone connects to a VoIP Server either through the Bluetooth network access point or Wi-Fi based on its availability.

From Left to Right: **Ng Jia Hui, Dr Ha Yajun, Tan Chaur Lih**

The winning design of Ng Jia Hui, **"Doctor's Assistant"**, is an embedded system which assists doctors by giving an initial diagnosis of a patient's condition using the electrocardiograph (ECG) obtained from the patient. Paramedics, and not specialized medical doctors, are rushed to aid people who suddenly fall ill. This embedded system allows paramedics to collect the ECG of a patient by attaching 3 electrodes to various parts of the body. The ECG is transmitted wirelessly to the medical specialist equipped with an Internet-enabled desktop, palmtop or even a mobile phone. Hopefully, with this information, the specialist could save the patient's life by instructing the paramedic to provide first-aid specific to the initially diagnosed ailment. Currently, ambulances in Singapore only carry a bidirectional radio, which carries only voice data between the ambulance and hospital. Her proposed system would allow the specialist at the hospital to be able to monitor the vital signs of a patient long before the patient is wheeled into the emergency room. Izad-Yar Daniel Rasheed and Laxmi R Iyer have made some initial contributions to the project and Tan Chaur Lih has offered great help at the final stage of the project.

Both NUS teams have successfully obtained the sponsorship of two Intel XScale processor development boards (worth US$4,800) from Intel China, as well as the airfare sponsorship from LEE Foundation Singapore.