

HARDWARE/SOFTWARE INTEGRATED TRAINING ON EMBEDDED SYSTEMS

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ABSTRACT. *Embedded System Education has become an important part of information disciplines' teaching programs, and attracted educators' attention in China. To counter the deficiency of practice training in some graduates' courses a new curriculum "Hardware/Software integrated design of embedded systems" is given at Tsinghua University. The course's main contents, teaching activities' arrangements, basic/research experiments, and a few kinds of embedded teaching experimental platforms are introduced. The merits and differences between the course and existing courses are indicated, and the necessity to build a powerful experimental environment for graduates to get practice skill is stressed.*

Keywords: Embedded system, Hardware/Software, Integrated design, Experimental platform

1. Introduction. With the development of computers, microelectronics and network technologies embedded systems and applications are becoming increasingly wider in almost all fields, and produce an inestimable impact on academics, industry, and daily life. Embedded systems involve computers, electronics, automation, network communications etc. multi-disciplines. Much knowledge and technologies, such as integrated circuits, microprocessor, operating system, compile principle, software engineering etc. are integrated together in embedded systems. And another main characteristic is that its hardware and software are bonded closely, so it is a good example to train hardware/software synthesis abilities for graduates [1].

However in some information engineering courses the practical training environments are deficient currently. The students can only program on the PC, have not enough conditions to touch hardware and low level software, so they don't know how to implement an algorithm or a function on a real product. This situation leads to a few graduates confronted with difficulties in looking for jobs. In order to change this situation a new course "hardware/software integrated design of embedded systems" has been given since 2003 at Tsinghua University in China, and a few embedded system experimental platforms were developed for the teaching. The course was ranked as "Tsinghua University Top Quality Course Plan", and got great support from the university.

The course's orientation and objective, teaching content, basic/research experiments are introduced, in particular, the teaching platforms, some application examples made by