Embedded System (ES)

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Curriculum Vitae-
Dr. Cheng-Kai Lu (呂成凱)

Education

Degree	Name of University	From		To	
		Y	M	Y	M
PhD	The University of Edinburgh, School of Engineering	2008	12	2012	11
PhD (Suspended)	The University of Oxford, General Engineering	2005	8	2006	8
Master	Fu Jen Catholic University, Electronic Engineering	2001	9	2003	6
Bachelor	Fu Jen Catholic University, Electronic Engineering (*Major in Control and VLSI)	1997	9	2001	6

Work Experience

Name of Company	Title	From		To	
		Y	M	Y	M
UTP, Malaysia	Program Manager(UTP-China, -Taiwan, -JP)	2018	5	2021	12
NARLabs, Taiwan	Adjunct Associate Researcher	2017	6	2020	6
IEEE EMBS Chapter	Executive Committee Member	2017	2	2018	2
UTP, Malaysia	Senior Lecturer (UK system equivalent to Associate Professor in US system)	2016	9	2021	12
NARLabs, Taiwan	Assistant Researcher & Technical Manager	2014	7	2016	8
Chyao Shiunn Electronics Co. Ltd, Shanghai	Director	2012	12	2014	6
NHS Lothian, UK	Research Fellow	2009	4	2011	4
Chyao Shiunn Electronics Co. Ltd, Shanghai	Section Mananger	2006	9	2008	9
Becker Avionics R & D Center, Taiwan	Firmware, Hardware Engineer & Project Manager	2003	10	2005	5
CSIST, TW	Assistant Researcher	2003	10	2005	5

Embedded System

Lecture: 3 hours/week

- 14:20 -17:20 every Wednesday (TD303)

Synopsis

- Develops a working knowledge of the characteristics and applications of devices used in embedded systems such as microcontrollers. Emphasis is put on the architecture, instruction sets, and assemblers. Representative data handling problems and interfacing are studied and tested in the laboratory using state-of-the-art hardware.

- **Pre-requisites**: Programming, Digital Logic Design, Microprocessor/Microcontroller.

Course Outcomes

1. **Convert** numbers from one **numbering systems** to another.
2. List and describe the fundamental parts of a microcontroller and **explain** the difference between a **microcontroller and a microprocessor**.
3. Explain the relationship between **hardware and software** and how they **work together** to accomplish a task.
4. Employ knowledge of **system architecture, digital logic elements, and processor schematics** to develop **instruction level solutions** to problems.
5. Express instruction level programs using **assembly language**.
6. Use **hardware peripherals** such as **timers, PWM, A/D, serial, IO ports, and interrupts to develop robust and full-featured microcontroller programs**.
7. Utilize an Integrated Development Environment (**IDE**) and a development board to assist in **project design, troubleshooting, and debugging**.
8. Develop and analyze **flow charts and hardware schematics** to deduce or describe the operation and functions of an embedded system.
9. **Synthesize** an embedded system and program from a **real-life problem** statement.

Course Grading

Coursework (100%)

Assignments/Labs	20 %
Presentation (Project)	20 %
Presentation (Case/Paper Study)	25 %
Project Report	25 %
Attendance & Participation	10 %

*The grading is subject to change.

Course Grading

Coursework (70%)

Assignments/Labs	10 %
Project & Presentation	30 %
Presentation (Case/Paper Study)	20 %
Attendance & Participation	10 %

Mid/Final examination 30%

*The grading is subject to change.

Reference Books

1. **No particular textbook is required** for this class. Instead, notes and slides will be provided for study. Publicly available and/or proprietary articles, videos, tutorials, and datasets will be used in this class.