微算機原理及應用

單元十:總結

授課老師: 林淵翔 老師

課程大綱

- 單元一 微電腦系統的簡介
- 單元二 8051的簡介與架構介紹
- 單元三 8051的組合語言程式設計
- 單元四 8051的程式設計工具
- 單元五 8051的輸入與輸出埠控制



課程大綱

- 單元六 8051的計時器
- 單元七 8051的非同步串列通訊界面
- 單元八 8051的中斷
- 單元九 8051的周邊電路與應用實例
- 單元十總結



微控制器應用: 穿戴式裝置(Wearable Devices)

We carable electronics With chips shrinking and sensors becoming chaque; personal computing is moving from that smartphone in your pocket to your arm, your wrist, right out to your fingerings. The glove that calls have called the photols and video that the photols and video that a calls have corline, after a calls have called that a love taps of your finger or the photols and your your wrist. Accessorize for access Bring one of that the photols and your your video the private with a private work of the private with a private work of the private which we will be provided the private which we will be provided the private with monitor your caloric intake, comencing you to the covided to the private which we will be comencing you to the covided to the provided that we will be comencing you to the covided the provided to the provided that we will be comencing you to the covided the provided that we will be comencing you to the covided that we will be comencing you to the covided that we will be covided to the provided to the provided that we will be covided to the provided that we will be covided to the provided to the provided that we will be covided to the provided to the provided that we will be covided to the provided that the provided that we will be covided to the provided that the provid













参考資料來源: NeuroSky, Nike, Withings, Myo, SONY http://www.saintinel.com/commentary/2013/04/02/wearable-electronics-how-far-is-too-far/

微控制器(單晶片)發展

• 高速、多功能、低耗電、多位元





1976~ 1978

第一顆單 晶片 8048





1978~ 1982

第二代單晶 片MCS-51 系列





1982~ 1990

單晶片引入哈佛架 構的RISC精簡指令 集,多元輸出入埠





1990年~ 至今

各大公司紛紛投入 市場,推出各具特 色單晶片



未來趨勢

高速度高功能 32位元單晶片, CMOS化低功 耗、低電壓晶 片

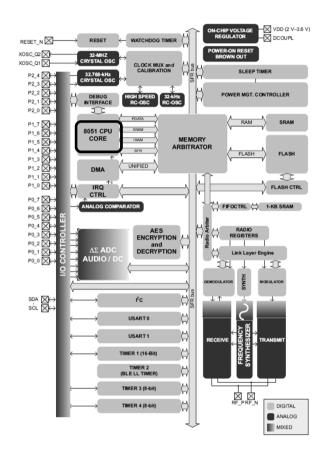


AT89S51和M0516的比較

Features	AT89S51	Nuvoton - M0516LDN
Core	8 bits	32bits ARM cortex-M0
Operating Frequency	Up to 33MHz	Up to 50MHz
Operating Voltage	4.0V ~ 5.5V	2.5V ~ 5.5V
Flash Memory	4K byte	64K byte
SRAM Memory	128 byte	4K byte
Timers	2 sets of 16-bit timer	4 sets of 32-bit timer
Watch Dog Timer	-	1 set
PWM/Capture	-	Up to eight-channel 16-bit PWM output
UART	1 set UART device	Up to 2 sets UART devices
SPI	-	- Up to 1 set of SPI device
I2C	-	1 set of I2C device Master/Slave up to 1Mbit/s
ADC	-	12-bit SAR ADC with 8 analog input
Interrupt	6 interrupt sources	NVIC for the 32 interrupt inputs, each with 4-levels of priority
Clock control	External crystal	4 to 24 MHz external crystal oscillator and 22.1184 MHz internal RC oscillator

系統晶片(SOC)

- 微控制器可以看成是一個系統 晶片(SOC), Ex: TI CC2541
 - BLE (Bluetooth Low Energy) SoC
 - 8051 CPU core
- Internet of Things (IoT): 物 聯網





課程宗旨

- 了解微處理機的工作原理與周邊裝置的控制方法,包含 CPU架構、程式設計、記憶體存取與規畫、輸出入介面 和周邊硬體電路...等,希望學習後可以有設計一微算機 系統的能力。
- 以8051打好基礎,將來可以很容易地延伸到各種微控制器的學習。



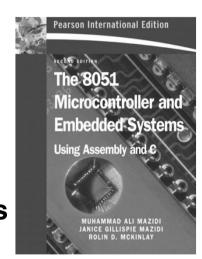
如何學好微控制器

- 了解微處理機的工作原理與周邊裝置的控制方法
- 至少熟悉C語言程式
- 實際動手做 (多看多做)
- 查看 Datasheet 和 Programming guide



參考文獻

- ATMEL AT89S51 datasheet (doc2487.pdf)
- ATMEL 8051 Microcontrollers Hardware Manual (doc4316.pdf)
- ATMEL 8051 Microcontroller Instruction Set (doc0509.pdf)
- The 8051 Microcontroller and Embedded Systems Using Assembly and C, Second Edition, by Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay.





教材製作團隊

- · 台灣科技大學電子系BEST實驗室
 - 王聰瑜、林秉豐、楊仕凡、黃柄源、林郁辰、姚嘉昇

