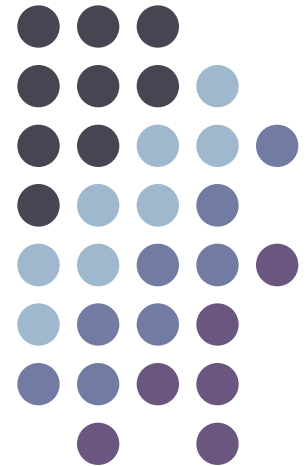
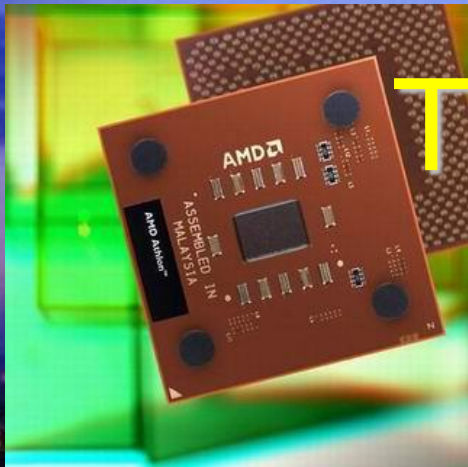


Embedded Computing Lab

Chia-Lin Yang

Department of Computer Science and
Information Engineering
National Taiwan University





The Bridge Connecting Hardware

and Software

The screenshot shows a web browser window displaying the homepage of the Advanced Computer Architecture Laboratory. The browser's address bar shows the URL <http://hcs.hk2.csis.szu.edu.cn/~wren/iaa2.html>. The page features a navigation menu on the left with links for news, research, seminar, members, and links. The main content area includes a header with the laboratory's name and logo, a section for a seminar (研討會), and a paper presentation schedule. The schedule lists several papers with their authors and dates.

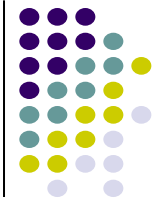
Advanced Computer Architecture Laboratory
The bridge connects hardware and software

Seminar 研討會

Paper Presentation Schedule
Maintained by Chanchito

- [A Highly-Configurable Cache Architecture for Embedded Systems](#) **M.H., 5/9, Coming Up!**
- [Temperature-Aware Microarchitecture](#) **Bunny, 5/9, Coming Up!**
- [Profile-based Dynamic Voltage and Frequency Scaling for a Multiple Clock Domain Microprocessor](#) **Noah, 5/16**
- [Positional Adaptation of Processors: Application to Energy Reduction](#) **Chanchito, 5/16**

Mission



*Innovative system architectural design to meet the **performance/power** demands for future **mobile cloud computing***

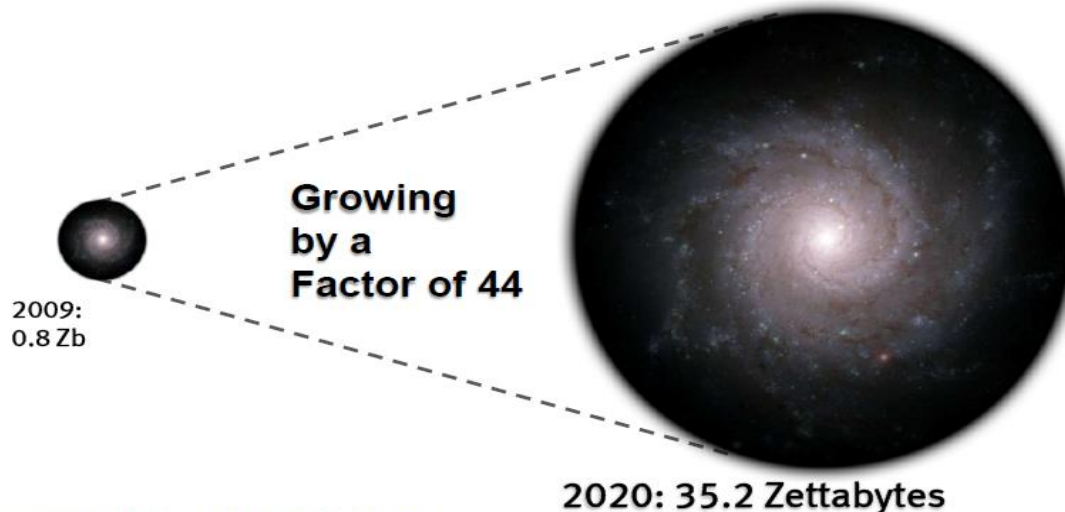


Direction I: Storage Architecture for Data-Centric Computing

- The amount of data being created is growing significantly faster than Moore's law, e.g., from 5 exabytes (10^{18}), in 2002 to 280 exabytes in 2009
- Partnership with 旺宏, 鈺創



The Digital Universe 2009-2020



Source: IDC Digital Universe Study, sponsored by EMC, May 2010



Flash-based Storage System is Everywhere



Removable media



Mobile devices

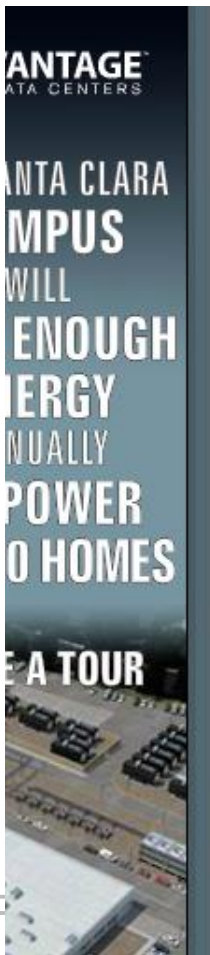
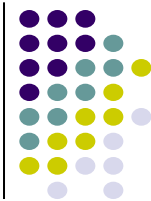


Disks in PCs & laptops



Datacenter

Facebook uses SSDs to speed up its data center infrastructure



Facebook's Appetite for SSD Boosts Fusion-io

By: Rich Miller
March 10th, 2011



Facebook's use of solid-state drives align with the company's relentless focus on performance and speed in optimizing its data center infrastructure to support more than 600 million global users. SSD Flash storage offers performance gains compared to hard disk drives, and Fusion-io has been an innovation leader in the space, benefiting

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T5DataCenter

Top Tier. Bottom Lir

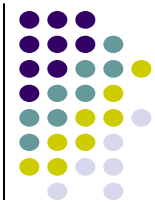
Tour the **Next Gen**
of Data Center

VISIT NOW »

Featured Cloud Articles

Building A Cloud-Savvy Model for TCO and ROI Tools that most IT teams use to evaluate TCO and



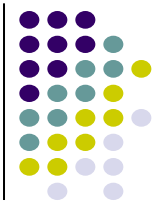


Storage System in Android Phone

- Storage in your phone is frequently accessed in our daily life
 - Audio/video playlists, email, browser's cache, or other data/information which needs to be well managed



Storage Industry in Taiwan



Enjoy **10x speed**
experience with JMicon!



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關於QNAP 產品資訊 產品功能 解決方案 新聞剪輯 技術支援 購買

產品資訊

網路儲存系列

▣ 頂級中小企業

▣ 中小型企業

▣ 家庭及個人工作室

安全監控系統

網路多媒體播放器

舊機種

線上體驗

相容性列表

首頁 > 產品資訊 > 網路儲存系列

Storage

Quality Network
Appliance Provider



網路儲存系列

首頁 > 討論區 > 數位與科技 > 新聞板

WD 第二座 SSD 研發中心坐落新竹！

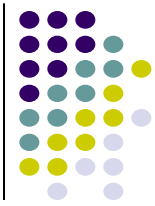
由 [Chevelle.fu](#) 於 四, 2011/12/08 - 10:15am 發表

[ssd](#) [wd](#) [western digital](#) [固態硬碟](#)

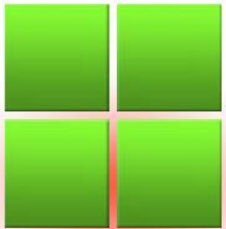


照片中為 WD 固態儲存部資深副總經理 Michael Hajeck，右為專案管理部副總裁 Nader Salessi，左為亞太區行銷總監羅昌平。

Direction II: Heterogeneous System Architecture



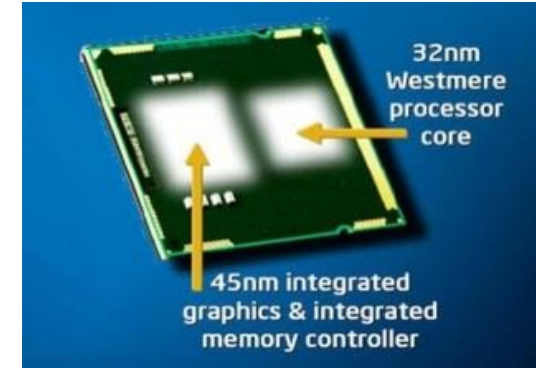
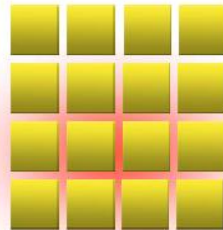
All Large Core



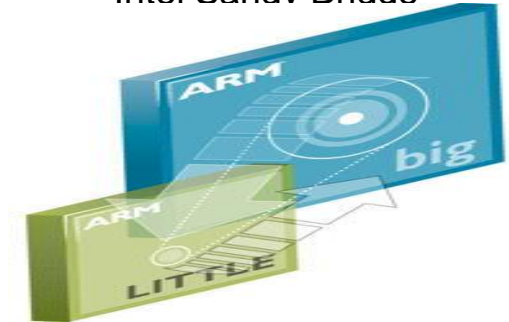
Mixed Large and Small Core

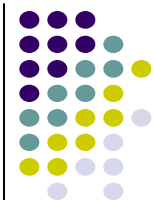


All Small Core



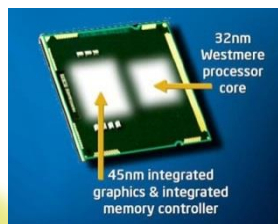
Intel Sandy Bridge



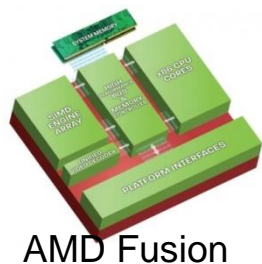


Memory System Design

- Novel memory hierarchy design for Android Platform
 - On integrated CPU/GPU architecture, e.g. AMD fusion, Intel Sandy bridge
 - Develop the first full-system simulation framework for Android-based integrated CPU/GPU platform
- Partnership with Intel, 工研院



Intel Sandy Bridge



AMD Fusion

ECLab

新聞	產品	專題	白皮書	講座	軟體
----	----	----	-----	----	----

5年1500萬美元，工研院與Intel共推3D記憶體
2011年12月06日

Intel與工研院、經濟部技術處共同宣佈
針對下世代記憶體技術的合作案，
未來五年總投入金額共達一千五百萬美元。

Industry

Local Industry

聯發科

邁威爾 (Marvel)

晶心科技

瑞昱

華碩

Global Industry

Nvidia

Arm

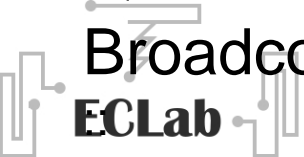
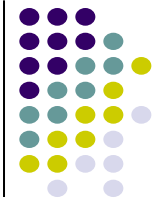
Intel

AMD

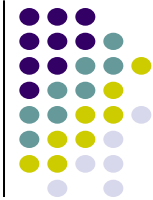
Qualcom

Broadcom

ECLab

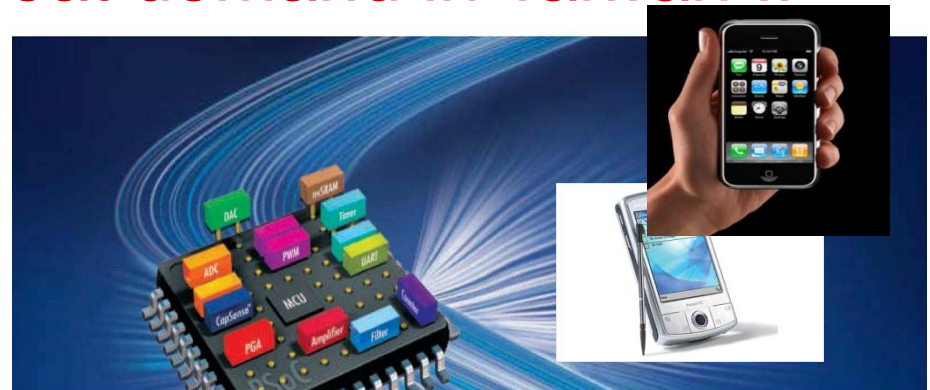


Why Join Embedded Computing Lab?



System Experts are in great demand in Taiwan !!

- System-on-Chip (SOC)
- Cloud computing
- Storage industry
- ...



FLEXIBILITY. INTEGRATION. PROGRAMMABLE ANALOG.

6 專題生 in my lab
have internship in
聯發科, 晶心科技, 智原,
工研院 in the past summer

System-on-Chip

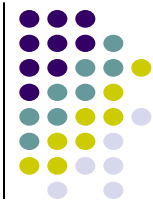
旺宏 工研院

資策會 鈺創

Strong industrial alliance



Why Join Embedded Computing Lab?



與世界接軌!

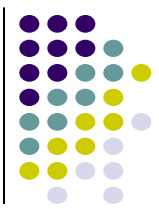
- Internship at IBM Research Lab, Austin !!
- Internship at Intel Research Lab, Portland !!
- Research opportunity @ SNU (Seoul National University)

最前瞻的研究!

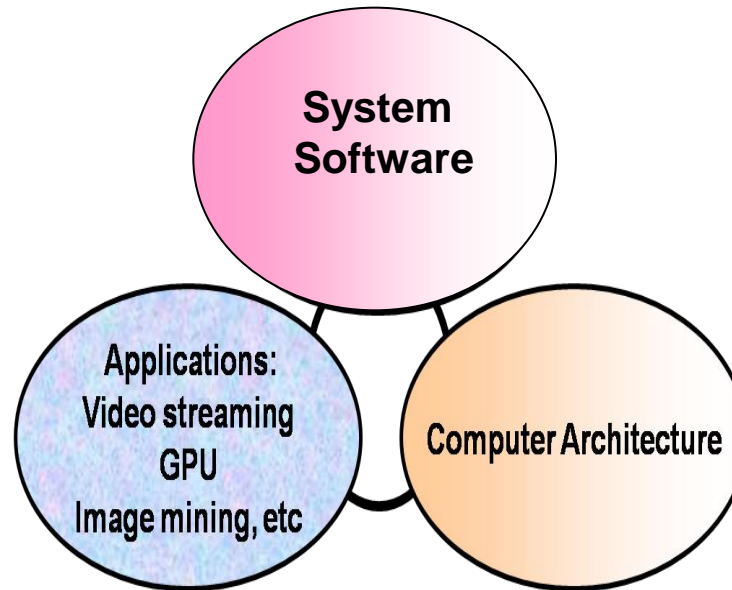
- IEEE Micro'10, first paper from Taiwan in 15 years
- USENIX Fast'12, first paper from Taiwan
- ISLPED'09 Best Paper Award
- ICCAD'09 Best Paper Nomination



Why Join Embedded Computing Lab?

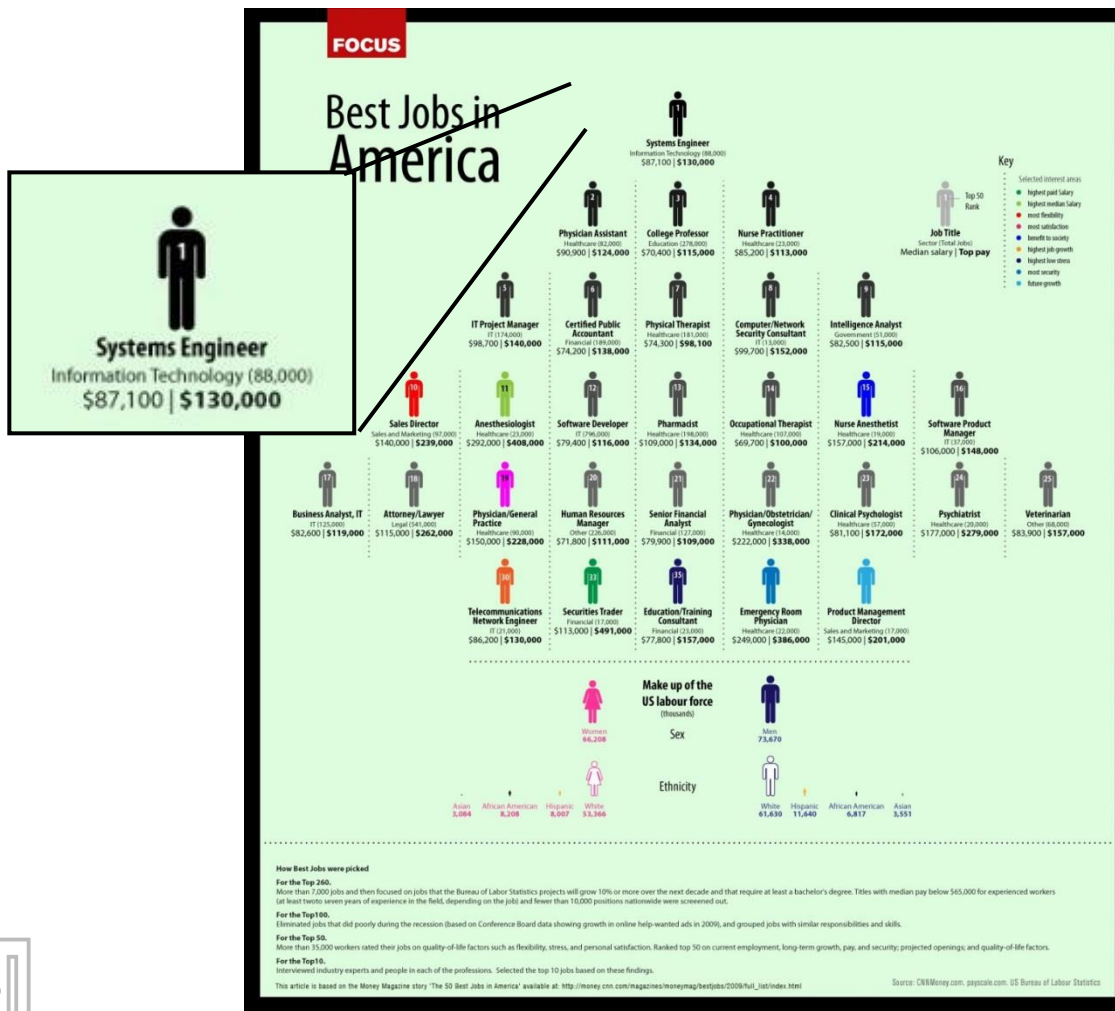
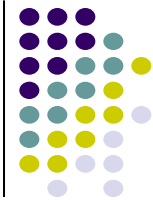


成為一個炙手可熱的人才!



Why Join Embedded Computing Lab?

- 2012 Best Job in America



Join Us !!!!



Please stop by at my office CSIE 411, yangc@csie.ntu.edu.tw