



臺灣大學



Final Paper Survey Report



Final Paper Survey Report

- Now, it is your turn to contribute!
- Make a report of survey and present to all the classmates
- 2—3 people/group (the same project group)
- Read documents/papers about **ESL and SoC Design**
- (Bonus) verification with ESL tools you have learned or other tools
- (Bonus) design some labs for future students



Recommended Topics

- UML for ESL
- Optimal design of bus matrix
- System-level power estimation and low power design
- Introduction to embedded OS
- Hardware/software co-design
- High-level synthesis
- OCP-IP and **OVP**
- System emulation with **ALDEC HES-DVM**
- GreenSoCs project
- Deep survey about TLM 2.0
- New EDA tools for ESL
- New ARM SoC architecture
- Other related topics

** The groups with RED topics will be automatically scheduled to 6/20.
Besides, the CoWare PA project will become optional.



Possible References

■ UML for ESL

- There is a book, UML-SystemC 晶片設計實務 written by 邱郁惠
- Mueller et al., "UML for ESL design: basic principles, tools, and applications," *Proceedings of the 2006 IEEE/ACM international conference on Computer-aided design*, pp. 73-80, 2006.

■ Optimal design of bus matrix **(don't choose this one)**

- S. Pasricha, Y.-H. Park, F. J. Kurdahi, N. Dutt, "System-Level Power-Performance Trade-Offs in Bus Matrix Communication Architecture Synthesis," *Proc. CODES+ISSS'06*, 2006.
- S. Pasricha, N. D. Dutt, and M. Ben-Romdhane, "BMSYN: Bus Matrix Communication Architecture Synthesis for MPSoC," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 26, no. 8, Aug. 2007.

■ Introduction to embedded OS **(don't choose this one)**

- eCos, Linux, uC/OS-II, RT-Linux, MeeGo, iOS, Android



Possible References

■ System-level power estimation and low power design

- ChipVision: PowerOpt
- TinnoTek: PowerMixerIP (available from CIC)
- E. Macii, M. Pedram, and F. Somenzi, "High-level power modeling, estimation, and optimization," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 17, no. 11, pp. 1061 - 1079, 1998.
- P. Landman, "High-level power estimation," *Proc. International Symposium on Low Power Electronics and Design*, pp. 29-35, 1996.
- L. Benini and G. de Micheli, "System-level power optimization: techniques and tools," *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, vol. 5, no. 2, pp. 115-192, April 2000.
- D. Brooks, Vivek Tiwari, and Margaret Martonosi, "Wattch: a framework for architectural-level power analysis and optimizations," *Proceedings of the 27th annual international symposium on Computer architecture (ISCA'00)*, 2000.



Possible References

■ Hardware/software partition

- Read the book, *Reading in Hardware/Software Co-Design*

■ High-level synthesis

- Mentor Graphics: Catapult C
- Forte Design System: Cynthesizer
- Cadence: C2Silicon
- ChipVision: PowerOpt
- R.K. Gupta and G. De Micheli, "Hardware-software cosynthesis for digital systems," *IEEE Design & Test of Computers*, vol. 10, no. 3, pp. 29-41, 1993.
- R. Ernst, J. Henkel, and T. Benner, "Hardware-software cosynthesis for microcontrollers," *IEEE Design & Test of Computers*, vol. 10, no. 4, pp. 64-75, 1993.
- R. Ernst, "Codesign of embedded systems: status and trends," *IEEE Design & Test of Computers*, vol. 15, no. 2, pp. 45-54, 1998.



Possible References

- **System emulation with ALDEC HES-DVM**
 - <http://www.aldec.com/en/products/emulation/hes-dvm>
- **OCP-IP and OVP**
 - <http://www.ocpip.org/>
 - <http://www.ovpworld.org/>
- **GreenSoCs project**
 - <http://www.greensocs.com/>
- **IP-XACT and Kactus2**
- **New EDA tools for ESL**
 - IDE for SystemC
 - OpenTLM
 - Verification tools for SystemC
 - ...
- **Deep survey about TLM 2.0**
 - Lab design?



Possible References

- New ARM SoC architecture
 - ARM processor technologies
 - ARM architecture v7
 - ...
 - AMBA 4.0
 - ARM's platform for different applications
 - ...



Action Items

- Proposal (1 A4 page)
 - Due: 5/31
 - To sychien@cc.ee.ntu.edu.tw
 - with subject MSoC final paper survey proposal
 - Topics
 - Descriptions
 - List of reference papers/book
 - List of group members
 - Preferred day and duration for presentation
- Oral presentation
 - 30min or more on request
 - 6/13, 6/20
- Deliver the PowerPoint files and related files
 - 6/20
 - To sychien@cc.ee.ntu.edu.tw
 - With Subject: MSoC final paper survey report: group X