International Center on Design-for-Nanotechnologies (IC-DFN)

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(Other participants are listed inside)
IC-SOC Overview (2000-2006)

◆ Project Summary
  ▪ Develop new design methodology to enable efficient giga-scale integration for system-on-a-chip (SOC) designs
  ▪ Project includes three major components
    • SOC synthesis tools and methodologies
    • SOC verification, test, and diagnosis
    • SOC design driver

◆ Research Team
  ▪ US
    • UCLA: Jason Cong,
    • UC Santa Barbara: Tim Cheng
  ▪ China
    • Tsinghua Univ.: Jinian Bian, Xianlong Hong, Zeyi Wang, Hongxi Xue
    • Peking Univ.: Xu Cheng
    • Zhejiang Univ.: Xiaolang Yan
    • Also include 10 faculty members from NTHU and NCTU in Taiwan

[Courtesy of Philips]
IC-SOC Project Outcome (2000-2006)

- Over 100 publications at major international conferences and journals

<table>
<thead>
<tr>
<th></th>
<th>Conferences</th>
<th>Journals</th>
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<tbody>
<tr>
<td>U.S.</td>
<td>54</td>
<td>15</td>
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<tr>
<td>China</td>
<td>17</td>
<td>16</td>
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- Education (as of 2006)

<table>
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<tr>
<th></th>
<th>Pd. D. Students</th>
<th>Post Doctors &amp; Visiting Researchers</th>
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<tbody>
<tr>
<td>U.S.</td>
<td>12</td>
<td>7</td>
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<tr>
<td>China</td>
<td>70</td>
<td>6</td>
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- International exchanges
  - 15 workshops in US and China (including Taiwan) since 2000
  - Around 100 attendees each year

- One of top-10 US/China collaboration project selected by NSF to highlight in 2005
Photo from 2003 Workshop in Kunming, China
IC-DFN Overview (2006 – Present)

- A follow-up project of IC-SOC
- Explore architecture and design issues associated with nanotechnologies
- Project focuses
  - Error-resilient architecture design
  - Highly scalable design tools
  - Systems-level integration
IC-DFN Organization

CHINA
X. Hong, Tsinghua U.
Tsinghua University (THU)
Peking University (PKU)
Zhejiang University (ZJU)

U.S.
J. Cong & T. Cheng
DIRECTORS
UCLA: J. Cong, K. Wang
UCSB: T. Cheng, E. Hu

TAIWAN
S.C. Chang, Natl. Tsinghua U.
Natl. Tsinghua University (NTHU)
Natl. Taiwan University (NTU)

Research Thrusts
- Design for Robustness: Cheng
- Higher Abstraction: Cong
- Efficient Design Automation:
  X.L. Hong THU) and C.L. Liu (NTHU)

Technology
Drivers: Hu & Wang

Architecture
Platform: Cong & Wang

Testbed:
Y.-L. Lin (NTHU)

Education Programs:
Cheng, Cong, & Hu
- Web-based meetings & seminars
- International internships
- Partnership with EAP
- Outreach programs
Acknowledgements

- **Strong supports from**
  - National Science Foundation
  - Chinese National Science Foundation
  - National Science Council

- **Great collaboration from**
  - UCLA
  - Peking Univ.
  - Zhejiang Univ.
  - National Taiwan Univ.
  - UCSB
  - Tsinghua Univ.
  - National Tsinghua Univ.