Advancing Moore's Law: Technological Challenges and Economic Considerations

Dr. Peng Bai, Intel

Joined Intel at 1991, Peng Bai is now vice president of the Technology and Manufacturing Group and director of the Derivative Logic Technology Development at Intel Corporation. He is in charge of SOC process technology development and the D1C fab, which is located in Hillsboro Oregon.

Previously, Dr. Bai held several engineering and management positions in the Portland Technology Development and worked on many generations of process technologies. He was the program manager for Intel 65nm process technology development, yield manager for 130nm and 90nm, process integration manager for 180nm, and process integration engineer for 350nm and 500nm. Bai has numerous published papers in science and engineering journals and holds two U.S. patents. He has won four Intel Achievement Awards.

Bai received his bachelor's degree in physics from the University of Bucharest in Romania in 1985. He received his Ph.D. from Rensselaer Polytechnic Institute in New York in 1991.

Design Methodology is Key to SoC Success

Dr. Charlie Huang, Cadence

Dr. Charlie Huang serves as Cadence Senior Vice President and Chief Strategy Officer, and is responsible for finding and evaluating growth opportunities for Cadence in EDA, the adjacencies and in developing markets. Dr. Huang also manages the Cadence investment portfolio, which consists of venture capital and direct investments. Dr. Huang is a twenty-year veteran of the electronic design automation industry, with experience as a CEO, entrepreneur, technologist and manager.

Dr. Huang was a General Partner at Telos Venture Partners in 2004 and 2005, after serving as Corporate Vice President of Integrated Circuit Solutions Business Development at Cadence. He also has had a variety of other responsibilities at Cadence, including product line management, product marketing and strategy, business development, mergers and acquisitions, and foundry relationships.

Prior to that, Dr. Huang co-founded CadMOS Design Technology, a company that provided solutions for signal integrity problems in ultra deep sub-micron processes. As CEO of CadMOS, he raised venture capital from a variety of investors and managed the company through its successful acquisition by Cadence in 2001. Before CadMOS, he was vice president of R&D at EPIC Design Technology, a startup that pioneered static timing analysis, fastmos, and RC extraction technologies for IC designs. After EPIC Design's successful IPO in 1996, it was acquired by Synopsys, where Huang became Vice President of R&D in the EPIC Technology Group.

Huang holds Bachelor of Science degrees in electrical engineering and computer science from Shanghai Jiao Tong University, and an MSEE and Ph.D. in electrical engineering from Carnegie Mellon University.

Superlens and Plasmonic Lithography Dr. Xiang Zhang, UC Berkeley

Professor Xiang Zhang is current Ernest S. Kuh Chair Professor and Chancellor's Professor at UC Berkeley and the Director of NSF Nano-scale Science and Engineering Center (NSEC) which includes Berkeley-UCLA-Stanford-MIT-Northwestern-UNCC. He also served as Director of Department of Defense MURI Center on Metamaterials and Devices that includes Berkeley-MIT-UCLA-UCSD-Duke-Imperial College (UK). He is also a Faculty Scientist at Materials Science Division at Lawrence Berkeley National Laboratory (LBNL) of US Department of Energy.

Professor Zhang's current research focused on nano-scale science and technology, meta- materials, nano-photonics and bio-technologies. He has published more than 150 technical papers including publications in *Science* and *Nature*. He has given over 120 invited, keynote and plenary talks at international conferences and institutions.

Professor Zhang is on editorial boards of three journals. He served as a Co-Chair of NSF Nano-scale Science and Engineering Annual Grantee Conferences in 2004 and 2005, Chair of Technical Program of IEEE 2nd International Conference on Micro and Nano Engineered and Molecular Systems in 2007, and Vice Chair of Advisory Board for The Research Center for Applied Science (RCAS), China Academy of Science (SINICA), Taiwan, ROC. He also served as a reviewer for MacArthur Fellowship, and journals such as *Science, Nature, and Physical Review Letters, etc.* Professor Zhang's research has been selected to be one of *Top Ten Nanotechnology Breakthroughs* in 2005, and *Fast Breaking Papers*, as one of the most cited recent papers in Physics in 2006, and *R&D Magazine*'s *top 25 the Most Innovative Products of 2006*. His work on superlens was selected as "*Top 100 Science Stories*" in 2007 by *Discover Magazine.* In 2008, his research in realization of optical negative refraction was selected by *Times Magazine* as "*Top 50 Innovations of the Year*", as well as "*Top 100 Science Stories*" by *Discover Magazine*. His research was frequently and widely featured by media by international media including *BBC News*, *CNN, ABC, CNBC, New York Times, Wall Street Journal, Times (London), Los Angeles Times, etc*., as well as professional magazines as *Physics Today, Scientific American, MRS Bulletin* (Materials Research Society), *Photonics Spectra, Materials Today, Physics Web, R&D Magazine, MIT Technology Review.* Professor Zhang is a recipient of NSF *CAREER Award* (1997); *Engineering Foundation Award* (1997); SME *Dell K. Allen Outstanding Young Manufacturing Engineer Award* (1998) and *ONR Young Investigator Award* (1999). He was selected as a "*Distinguished Lecturer*" at University of Texas at Austin in 2004 and SEMETECH in 2005.

Professor Zhang received Ph.D from UC Berkeley. He was an assistant professor at Pennsylvania State University, and associate professor and full professor at UCLA prior joined Berkeley faculty in 2004.

Data: Center of the Future Data Center

Dr. Charles Fan, EMC

Dr. Charles Fan is a Senior Vice President and Chairman of China Center of Excellence at EMC Corporation. EMC Corporation is a leading provider of information infrastructure products and solutions, with over 40,000 employees worldwide and over $14B in revenue in 2009.

Dr. Fan is currently responsible for EMC's strategy, research and development in the area of next generation virtual storage. He founded EMC China R&D Center in 2006, and led the R&D efforts at the Center. The Center grew to over 600 engineers in three years, changed its name to China Center of Excellence, and became known as one of the most successful multi-national R&D organizations in China. Prior to joining EMC, Dr. Fan was a co-founder and CTO of Rainfinity, a pioneering company in file virtualization before it was acquired by EMC in 2005.

Dr. Fan is an expert in the areas of network storage and distributed systems, with a number of publications and patents. He was awarded the Top Ten IT Young Elite in Shanghai City in 2008 while he was building EMC's China R&D Center. He is a member of Mayor's Advisory Board in Chengdu City and a member of Chinese Cloud Computing Expert Committee.

Fan received his Bachelor degree from the Cooper Union, and his Master and PhD degrees in Electrical Engineer from California Institute of Technology.

Recovery in the Semiconductor Industry

Dr. Daniel Tracy, SEMI

Dr. Daniel Tracy is responsible for developing and executing the global strategy for SEMI industry research and statistics products and services. Current market statistics products include monthly and quarterly data programs covering semiconductor capital equipment, materials and components, with in-depth annual reports on a variety of topics such as packaging materials and trends in emerging markets. Tracy is responsible for preparing market reports and presenting on trends impacting the electronic materials and equipment markets globally, and also for managing market statistics partnerships globally.

Prior to joining SEMI in 2000, Tracy was a Research Associate with Rose Associates, a prominent market research and consulting firm specializing in electronic materials. Prior to this, Tracy was employed at National Semiconductor's Package Technology Group.

Tracy has a Ph.D. in Materials Engineering from Rensselaer Polytechnic Institute, a M.S in Materials Science & Engineering from Rochester Institute of Technology and a B.S. in Chemistry from State University of New York (SUNY) College of Environmental Science and Forestry.