

Prof. Dr. Che-Rung LEE 李哲榮

Contact Information

cherung@cs.nthu.edu.tw
Department of Computer Science
National Tsing Hua University
101, Sec. 2, Kuang-Fu Rd, Hsinchu 30013, Taiwan



Education / Positions

Education

- 1992-1996 Bachelor, Department of Computer Science, National Tsing Hua University
- 1998-2000 Master, Department of Computer Science, National Tsing Hua University
- 2000-2006 PhD, Department of Computer Science, University of Maryland, College Park

Employment

- 2007-2008 Postdoctoral Researcher, University of California, Davis
- 2008-2013 Assistant Professor, Dep. of Computer Science, National Tsing Hua University
- 2011 Visiting Scientist, IBM T.J. Watson Research Center (Dr. I-Hsin Chung)
- 2013-Now Associate Professor, Dep. of Computer Science, National Tsing Hua University

Short Overview about Scientific Work

1. Cloud Computing and Virtualization
 - (a). InfiniBand and GPU virtualization
 - (b). Optimization for virtual machines: migration, memory deduplication (KSM)
 - (c). Container technology: kernel module and network virtualization
 - (d). Optimization on big data processing systems: Storm, MapReduce
2. GPU Technology
 - (a). GPU optimization for deep learning: fast convolution, cross layer optimization
 - (b). GPU for next generation video encoding/decoding HEVC
 - (c). GPU for social network algorithms: triangle counting, centrality
 - (d). GPU performance optimization: compression, synchronization, sampling
3. High Performance Computing
 - (a). Performance optimization of quantum electron simulations
 - (b). Task mapping problem for supercomputer
 - (c). Performance modelling of speculation execution and transactional memory
 - (d). Scheduling for performance and energy efficiency: grid, heterogeneous multi-core
4. Numerical Analysis and Package Development
 - (a). Computing matrix exponential problem with checkerboard method
 - (b). RAPACK: Fortran package for large eigenproblems using Residual Arnoldi method
 - (c). QUEST: QUANTUM Electron Simulation Toolbox.
 - (d). Eigentest: A test matrix generator for large-scale eigenproblem.

Recent key Publications

- ShiouCheng Yu, Quey-Liang Kao, **Che-Rung Lee**: Performance Optimization of the SSVD Collaborative Filtering Algorithm on MapReduce Architectures. IEEE DataCom (2016): 612-619 (Best Paper Award)
- Kuan-Hsin Lee, I-Cheng Lai, **Che-Rung Lee**: Optimizing back-and-forth live migration. IEEE/ACM UCC (2016): 49-54
- Hao-Che Kao, I-Ching Wang, **Che-Rung Lee**, Chi-Wen Lo, Hao-Ping Kang, Accelerating HEVC Motion Estimation Using GPU IEEE BigMM (2016)

- Hao-Ping Kang, **Che-Rung Lee**, Improving Performance of Convolutional Neural Networks by Separable Filters on GPU. Euro-Par (2015): 638-649
- Shih-Hsiang Lo, **Che-Rung Lee**, Quey-Liang Kao, I-Hsin Chung, Yeh-Ching Chung: Improving GPU Memory Performance with Artificial Barrier Synchronization. IEEE Trans. Parallel Distrib. Syst. 25(9): 2342-2352 (2014)
- Po-Chi Shih, Kuo-Chan Huang, **Che-Rung Lee**, I-Hsin Chung, Yeh-Ching Chung: TLA: Temporal look-ahead processor allocation method for heterogeneous multi-cluster systems. J. Parallel Distrib. Comput. 73(12): 1661-1672 (2013)
- **Che-Rung Lee**, Minimal Split Checkerboard Method for Exponentiating Sparse Matrices and Its Applications in Quantum Statistical Mechanics. SIAM Journal of Scientific Computing (2013).