

# Xinxin Mei

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## Education

- **Ph.D. in Computer Science** Sep. 2011 – (exp.) Aug. 2016  
Hong Kong Baptist University (HKBU)  
**Courses:** Numerical Methods II, Numerical Methods for Partial Differential Equations, Special Topics in Mathematics: Financial Derivative and Practice
- **B.Eng. in Electronic Engineering and Information Science** Sep. 2006 – Jul. 2010  
University of Science and Technology of China (USTC)

## Experience

- **Research assistant** Department of Computer Science, HKBU Oct. 2010 – present
  - ◇ **Energy efficient task scheduling on CPU-GPU heterogeneous platforms** Mar. 2015 – present
    - Build the power and performance models for GPUs with dynamic voltage/frequency scaling (DVFS)
    - Solve the optimization problem both numerically and analytically to minimize energy consumption
    - Design and implement task schedule algorithms considering DVFS
  - ◇ **Exploring GPU memory hierarchy through microbenchmarking** Nov. 2013 – Apr. 2015
    - Designed a novel GPU-based microbenchmark to unveil the cache structures
    - Revealed the memory characteristics of all the 3 recent generations of GPU products
  - ◇ **Implementation of deep neural network (DNN) on GPU clusters** (teamwork) Jul. 2014 – Aug. 2014
    - Tested the performance of the GPU-accelerated DNN on heterogeneous clusters
    - Surveyed the parallel batch stochastic gradient descent (SGD) method
  - ◇ **GPU energy conservation by DVFS** Apr. 2013 – Oct. 2013
    - Sought the potential of GPU DVFS with third-party tools
    - Measured the energy consumption of a large test set of 37 GPU-based applications with DVFS
    - Quantitatively analyzed the experimental results of 18,500 groups of data
  - ◇ **GPU-accelerated finite difference time domain (FDTD) solvers** Sep. 2011 – Mar. 2013
    - Surveyed numerical partial differential equation (PDE) solvers, especially FDTD solvers
    - Wrote a GPU-accelerated large scale 3D FDTD program to solve the Maxwell Equations
- **Teaching assistant** Department of Computer Science, HKBU Sep. 2011 – Jun. 2014

## Skills

- **Computer**
  - Programming* – C, MATLAB; CUDA C (GPU programming)
  - Platform* – Microsoft Office, Latex, MATLAB, Microsoft Visual Studio, Linux
  - Experience* – Parallel numerical PDE solvers, especially FDTD method
  - MATLAB PDE/optimization tools
  - Parallel GPU-accelerated computing, the GPU microarchitectures
- **Language**
  - Mandarin* – Native proficiency
  - Cantonese* – Professional working proficiency
  - English* – Professional working proficiency

## Scholarships and Awards

- Teaching Assistant Performance Award Jun. 2014
- Teaching Assistant Performance Award Dec. 2012
- Postgraduate Scholarship Sep. 2011
- Outstanding Student Scholarship Jan. 2008
- Outstanding New Student Award Oct. 2006

## Activities

- Academic presentations:
  - “Benchmarking the Memory Hierarchy of Modern GPUs”, NPC2014 Sep. 2014
  - “A Measurement Study of GPU DVFS on Energy Conservation”, HotPower’13 Nov. 2013
- Gold, post-secondary division, the 8th Hong Kong Inter-School Dance Sport Competition Apr. 2011

## Publications

- **X. Mei** and X. Chu, “Dissecting GPU Memory Hierarchy through Microbenchmarking”, IEEE Transactions on Parallel and Distributed Systems, 2016 (*accepted*).
- **X. Mei**, K. Zhao, C. Liu and X. Chu, “Benchmarking the Memory Hierarchy of Modern GPUs”, the 11th IFIP International Conference on Network and Parallel Computing (NPC 2014), Ilan, Taiwan, Sep. 2014.
- **X. Mei**, L. Yung, K. Zhao, and X. Chu, “A Measurement Study of GPU DVFS on Energy Conservation”, USENIX HotPower’13, co-located with the 24th ACM Symposium on Operating Systems Principles (SOSP), Pennsylvania, USA, Nov. 2013.
- Q. Li, C. Zhong, K. Zhao, **X. Mei** and X. Chu, “Implementation and Analysis of AES Encryption on GPU”, the 3rd International Workshop on Frontier of GPU Computing, Liverpool, UK, Jun. 2012.

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## 教育背景

|                   |          |        |    |
|-------------------|----------|--------|----|
| 2011.09 – 2016.08 | 香港浸会大学   | 计算机科学  | 博士 |
| 2006.09 – 2010.07 | 中国科学技术大学 | 电子信息工程 | 本科 |

## 工作经历

|                   |              |      |
|-------------------|--------------|------|
| 2010.10 – 2016.08 | 香港浸会大学计算机科学系 | 研究助理 |
| 2011.09 – 2014.08 | 香港浸会大学计算机科学系 | 教学助理 |

## 项目经历

|                   |                                                                                                                                                                                                                        |        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 2013.04 – 2016.08 | <b>异构服务器上动态调频率调压技术的节能任务调度</b>                                                                                                                                                                                          | 博士研究课题 |
|                   | <ul style="list-style-type: none"><li>- 测量图形处理器 (GPU) 的功耗数据 18500 组, 分析、建立数学模型</li><li>- 设计内存访问算法并解构三代 GPU 的内存硬件结构</li><li>- 运用最优化方法和启发式算法设计节能调度算法并仿真实验</li><li>- 迄今发表英文学术论文 2 篇, 短文 1 篇, 英语学术报告 2 次; 投稿 1 篇</li></ul> |        |
| 2014.07 – 2014.08 | <b>GPU 集群上的深度学习神经网络实现</b>                                                                                                                                                                                              | 小组项目   |
|                   | <ul style="list-style-type: none"><li>- 协调小组成员间项目进度, 书写会议报告、进度报告等</li><li>- 负责关键数值算法的调研, 并承担集群性能测试工作</li></ul>                                                                                                         |        |
| 2011.09 – 2013.03 | <b>GPU 平台上的并行偏微分方程数值解法</b>                                                                                                                                                                                             | 研究课题   |
|                   | <ul style="list-style-type: none"><li>- 学习数值分析算法, 尤其是物理、金融偏微分方程数值解法</li><li>- 学习 GPU 硬件编程语言 CUDA, 并使用其实现三维复频域麦克斯韦方程组的时域差分法快速并行求解</li></ul>                                                                             |        |
| 2010.04 – 2010.07 | <b>FPGA 数字频率计设计</b>                                                                                                                                                                                                    | 本科毕业设计 |
|                   | <ul style="list-style-type: none"><li>- 利用 VHDL 编程语言设计实现 FPGA 上的数字频率计</li></ul>                                                                                                                                        |        |
| 2008.08 – 2008.10 | <b>剧场表演机器人开发</b>                                                                                                                                                                                                       | 本科项目竞赛 |
|                   | <ul style="list-style-type: none"><li>- 使用舵机等电子元器件设计组装轮式和步行机器人</li><li>- 使用单片机编程语言控制机器人完成预定动作的表演</li></ul>                                                                                                             |        |

## 专业技能

- 专业背景: 并行计算, GPU 并行编程, 偏微分方程、最优化数值计算
- 精通编程语言: C、CUDA C (GPU 并行计算语言)、MATLAB
- 了解编程语言: R、Python、C++、Excel VBA、HTML/CSS、VHDL 等
- 开发环境: Windows/Linux 操作系统、MATLAB、Microsoft Visual Studio C++
- 办公软件: Microsoft Office、Latex
- 大学英语四级 (593), 大学英语六级 (550), 能用英语流利交流/书写学术论文
- 广东话熟练, 可与本地人交流

## 荣誉奖励

|                   |          |         |
|-------------------|----------|---------|
| 2012.12 / 2014.06 | 香港浸会大学   | 优秀教学助理  |
| 2011.09           | 香港浸会大学   | 全额博士奖学金 |
| 2008.01           | 中国科学技术大学 | 优秀学生奖学金 |
| 2006.10           | 中国科学技术大学 | 杰出新生奖   |

## 个人评价

经受长期的科学研究训练, 资料搜集能力佳, 学习能力强, 数学计算机背景好, 善于发现思考解决问题