

# Gaurav Mitra

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

Energy Efficient High Performance Computing, Computer Architecture, Real Time and Embedded Systems, Concurrent & Distributed Systems, Machine Learning, Computer Vision

## TERTIARY EDUCATION

**Australian National University**, Canberra, ACT, Australia

*Doctor of Philosophy - Computer Science*

**February 2011 – Present**

- Panel: Prof. Alistair Rendell (CECS, ANU), Dr. Eric McCreath (CECS, ANU), Dr. Jun Zhou (SICT, Griffith)
- Research Statement: Low-powered System-on-chips are effective building blocks for energy efficient high performance cluster computers
- Research Objectives:
  - Demonstrate that low-powered SoCs such as ARM SoCs provide high GFLOPS/Watt when all processing elements on-chip are utilized effectively
  - Evaluate each type of processing element on ARM SoCs including CPU, Floating-point unit, SIMD vector unit, GPU, DSP for different HPC workloads and assess their capabilities
  - Evaluate cluster programming models including Hybrid OpenCL+MPI, OpenMP Accelerator+MPI, OpenCL+PGAS(UPC/X10) and OpenMP Accelerator+PGAS
  - Build hardware and software framework for high resolution measurement of energy and power consumption on ARM SoCs
- Current Work:
  - OpenMP Accelerator “dispatch” on TI TCI6638K2K quad-core ARM Cortex A15 + eight core C6678 DSP using the Open Event Machine RTOS API and on-chip Hardware Queues
  - Programming the Adapteva Epiphany 64-core co-processor

*Bachelor of Software Engineering(Hons.)/Bachelor of Science* **February 2006 – December 2010**

- Graduation date: 10<sup>th</sup> December, 2010
- Degree Average : **77% (Distinction Average)** over 42 courses
- Honours Grade: **Second Class, Division A**
- Majors : Software Engineering, Mathematics, Computational Modeling
- Significant projects completed during coursework :
  - *Project Name* : The Linux Robotics Framework  
*Supervisor* : Ms. Lynette Johns-Boast, ANU  
*Description* : Worked on a year long group project to create a Linux Robotics Framework to provide standardized interfaces for the development of basic robotics functionalities such as servo control, motor control , kinematics , navigation etc. It is an open source component based library written in C in an object oriented fashion, portable across several architectures including the Atmel AVR32, ARM and the Intel x86. **This project won the 2009 AIIA National iAward in the tertiary project category.** [www.iawards.com.au](http://www.iawards.com.au).
  - *Project Name* : Query Interface for Semantic Web Services  
*Supervisor* : Dr. Xuan Zhou, Dr. Athman Bouguettaya, CSIRO
  - *Project Name* : A Web Service Request Language  
*Supervisor* : Dr. Xuan Zhou, Dr. Athman Bouguettaya, CSIRO

## PUBLICATIONS

- Eric Stotzer, Ajay Jayaraj, Murtaza Ali, Arnon Friedmann, **Gaurav Mitra**, Alistair P. Rendell, Ian Lintault. *OpenMP on the Low-Power TI Keystone II ARM/DSP System-on-chip*, 9th International Workshop on OpenMP, IWOMP 2013, Canberra, Australia, September 16-18, 2013.
- **Gaurav Mitra**, Beau Johnston, Alistair P. Rendell, Eric McCreath, Jun Zhou. *Use of SIMD Vector Operations to Accelerate Application Code Performance on Low-Powered ARM and Intel Platforms*, Parallel and Distributed Processing Symposium Workshops & PhD Forum (IPDPSW), 2013 IEEE 27th International. IEEE, 2013.
- **Gaurav Mitra**, Xuan Zhou, Athman Bouguettaya and Xumin Liu. *A Request Oriented Model for Web Services*, 1st Australasian Web Conference (AWC 2013), Adelaide, South Australia. Conferences in Research and Practice in Information Technology (CRPIT), Vol. 144, pages 13-20, 2013.

SECONDARY  
EDUCATION

**Don Bosco School**, Park Circus, Kolkata, India

**March 1993 – March 2005**

*Higher Secondary Level, 2005*

- Board: Indian School Certificate (ISC)
- Percentage: **93.25%** (Within top 0.3%)

*Secondary Level, 2003*

- Board: Indian Certificate of Secondary Education (ICSE)
- Percentage: **94.4%** (Within top 0.2%)

AWARDS AND  
SCHOLARSHIPS

- **Microsoft Imagine Cup Australia, 2011**, Placed 3rd in Australia for developing “Social Alert”- Disaster Response and Management System
- **Australian Postgraduate Award, Aug 2011 - Present**, Australian Government PhD stipend scholarship of \$24,653 per annum replacing CSIRO stipend as a result of getting Australian permanent residency.
- ANU Miscellaneous Scholarship, Feb 2012 - Present, ANU PhD stipend top-up scholarship of \$7000 per annum.
- CSIRO OCE Postgraduate Top Up Scholarship, Feb 2011 - Feb 2012, PhD stipend top-up scholarship of \$7000 per annum.
- CSIRO ICT Centre Postgraduate Research Scholarship, Feb 2011 - Aug 2011, PhD stipend scholarship of \$20,000 per annum.
- ANU HDR Merit Scholarship, Feb 2011- Aug 2011, Covers full international student tuition fees for entire duration of PhD.
- **AIIA National iAward**, Australian Information Industry Association (AIIA), Callista Tertiary Student Project Category, for the Linux Robotics Framework, 2009 Participated in the Asia Pacific ICT Awards, Melbourne 2009.
- **ANU International Undergraduate Scholarship, 2006-10**, Covered full international undergraduate student tuition fees for entire duration of BEng/BSc degree.
- Member of Golden Key International Honour Society

EMPLOYMENT  
EXPERIENCE  
(IT)

**Australian National University**, Canberra, ACT, Australia

*Teaching Assistant*

**July 2009 – November 2009, July 2010 – November 2010**

Computer science unit: Concurrent & Distributed Systems (COMP 2310).

Course lecturer : Dr. Alistair Rendell (2009), Dr. Felix Shill (2010).

*Teaching Assistant*

**February 2010 – June 2010, February 2011 – June 2011**

Computer science unit: Introduction to Programming and Algorithms (COMP 1100).

Course lecturer : Dr. Clem Baker-Finch.

*Teaching Assistant*

**February 2013 – June 2013**

Engineering unit: Systems Engineering Design (ENGN 2225).

Course lecturer : Chris Browne.

**National ICT Australia**, Canberra, ACT, Australia

*Visiting Researcher (Software Engineer)*

**August 2009 – May 2010**

Software Engineer working part-time for the InterfereX project at NICTA Canberra Research Lab. Responsibilities include requirements specification, design, development, testing and maintenance of ARM based embedded systems software written in C++.

Project Leader : Dr. Mark Reed.

**Burton & Garran Hall**, Canberra, ACT, Australia

*IT Assistant / Webmaster*

**February 2009 – November 2009**

Residential scholar with a portfolio of IT Assistant / Webmaster for residents of the hall.

**CSIRO**, Canberra, ACT, Australia

*Vacation Scholarship Student*

**November 2008 – February 2009**

Worked in the Web Services Division at CSIRO, ICT Center, Canberra.

Supervisor: Dr. Xuan Zhou, Dr. Athman Bouguettaya

EMPLOYMENT  
EXPERIENCE  
(OTHER)

**Unilodge@ANU**, Canberra, ACT, Australia

*Senior Residential Scholar*

**January 2013 – Present**

Senior Resident with a portfolio of pastoral care for residents of the Unilodge. Responsibilities include timely incident response, fire warden, being accessible to residents, first-aid emergency response and pastoral care. Scholarship valued at \$5000 per annum.

**Burton & Garran Hall**, Canberra, ACT, Australia

*Summer Senior Residential Scholar*

**November 2008 – February 2009**

Senior Resident with a portfolio of pastoral care for residents of the hall. Responsibilities include that of a duty warden for the hall.

COMPUTER  
SKILLS

- *Programming Languages* : C, C++, Java, Python, C#, Haskell, ADA, PHP, Bash
- *Parallel Programming* : pThreads, OpenMP, MPI
- *GPU Programming* : Nvidia CUDA, OpenCL, Google Renderscript
- *DSP Programming* : TI Code Composer Studio, SYS/BIOS MCSDK, Linux MCSDK
- *Software Development Kits* : Android, Google Web Toolkit, Microsoft Silverlight
- *Version Control* : Git, Mercurial, SVN, CVS
- *Operating Systems* : Linux, Mac OS X, Windows
- *Project Management* : Jira, Crucible, Fisheye
- *Computer Aided Designing* : The Gimp, Adobe Photoshop, L<sup>A</sup>T<sub>E</sub>X

REFEREES

**Prof. Alistair Rendell**

Deputy Dean, CECS  
Australian National University  
Canberra, ACT, Australia  
e-mail: Alistair.Rendell@anu.edu.au

**Dr. Mark Reed**

Founder, CEO  
InterfereX,  
Canberra, ACT, Australia  
e-mail: mark.reed@interferex.com

**Dr. Eric McCreath**

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Australian National University  
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**Dr. Ashvin Parameswaran**

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e-mail: reslifemgr@unilodge.com.au

**Dr. Jun Zhou**

Lecturer/Research Fellow, SICT  
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Nathan, QLD, Australia  
e-mail: Jun.Zhou@griffith.edu.au