Sugandha Sharma

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Education

University of Waterloo
Degree — 2016-2017

System Design Engineering, MASc
Member of the Computational Neuroscience Research Group

University of Waterloo
Degree — 2010-2015

Bachelor of Applied Science
Honours Electrical Engineering, Co-operative Program
Management Sciences Option
Degree Honours: With Distinction, Dean's Honours List

Research Experience

Graduate student, Computational Neuroscience Research Group
Waterloo, ON — Jan 2016-Present

Worked on interesting side projects which led to publications (not a degree requirement).

Accomplishments (publications)
- **Journal Publication**
  Sharma, S., Aubin, S., & Eliasmith, C. (2016). Large-scale cognitive model design using the Nengo neural simulator. Biologically Inspired Cognitive Architectures.

- **Conference Publications**
  Sharma, S., Komer, B., Stewart, T., & Eliasmith, C. (2016). A Neural Model of Context Dependent Decision Making in the Prefrontal Cortex. Proceedings of 38th annual conference of the Cognitive Science Society.

  Sharma, S., & Tripp, B. (2016). How is scene recognition in a convolutional network related to that in the human visual system? Proceedings of 25th International Conference on Artificial Neural Networks.

Research Assistant, Computational Neuroscience Research Group
Waterloo, ON — Jan 2015-Dec 2015

Worked part-time as an undergraduate from Jan-April and full time from May-Dec. Some of the work done during this time paved the way for the above mentioned publications.

Accomplishments
- Developed models of large scale systems (in Python) to replicate behavioral performance on cognitive tasks.

- Developed software tools & reusable components for quickly constructing such models.
- Wrote and presented research and technical findings.

Teaching Experience

Teaching Assistant, University of Waterloo
Waterloo, ON — Sept 2015-Dec 2015

Worked part time as a teaching assistant for a second year course (Engineering Economics of Design) offered by the System Design Engineering department.

Accomplishments
- Prepared and delivered tutorials to a class of 96 students.
- Held office hours to clarify doubts, and marked the assignments, quizzes and exams.

Instructor, Nengo Summer School
Waterloo, ON — June 2015 and June 2016

Nengo Summer School is a two-week long workshop on large-scale brain modelling organized by the Computational Neuroscience Research Group at University of Waterloo. Participants include graduate students, professors and working professionals from around the world.

Accomplishments
- **Working Memory**: Attended the Nengo Summer School 2015 as a participant and worked in a group of four to build a neural model of working memory. We successfully reproduced the recency and primacy effect plots as found in the human data.

- **Sequence Conditioning**: Facilitated the Nengo Summer School 2016 as an instructor and helped in building a neural model of sequence conditioning. The goal was to model an experiment in which participants learnt a motor representation of a piano key sequence through repetition, without consciously remembering the sequence. The model was built to replicate this learning process and to discover the underlying computational principles.

Industry Experience

Software Developer, Advanced Micro Devices (AMD)
Markham, ON — Sept-Dec 2014

Worked on Kernel Mode Driver development for graphics chips to work with the latest Windows operating system.

Accomplishments
- Developed software support for Multi GPU-Single Large Surface features in C++.
- Implemented workarounds for windows applications involving kernel-OS interactions.
- Resolved bugs in the graphics driver by working with graphics driver architecture and OS/driver/BIOS interactions, using debuggers & profilers.
- Performed software code analysis for performance optimization (optimal resource utilization and dead code removal).
- Carried out hybrid graphics experiments and learnt about DirectX & OpenGL APIs and the windows display driver model.

Systems Engineer, Nvidia
Santa Clara, California — Jan-May 2014

Mostly worked in the lab, on voltage regulators used in the power supply on graphics cards. Took initiative to automate existing procedures for taking measurements, which saved hours of time.

Accomplishments
- Successfully applied control system theory and stability analysis to analyze and design compensation circuits for power converters used on graphic cards.
- Analyzed and debugged acoustic noise issues found on graphic cards by measuring power rails to look for correlation. Also ran experiments to propose fixes.
- Examined power efficiency of graphics cards in various modes of operation with static and dynamic loads. Successfully developed a relatively efficient procedure for validating OCP (Over Current Protection) limits and taking load line measurements.
- Independently automated the efficiency measurement procedure for graphic cards by developing the tool infrastructure (in Python) using the GPIB interface for communication between the electronic load machine and the data acquisition system.

Systems Engineer, Nvidia
Santa Clara, California — April-August 2013

Mostly worked on software development and on updating schematic designs of graphics boards.

Accomplishments
- Updated reference schematic designs for the memory interface corresponding to various configurations (gddr5x16, gddr5x32, sddr4 and co-layout boards). Learn about schematic circuit design and high speed PCB layout techniques.
- Developed a web user interface (in Perl/Html) for an Asset Tracker database used to track company assets.
- Wrote QA procedures (in Perl language) to run prior to releasing changes to the hard drive cloning system used for cloning hard drives with the required Operating system.
- Toured PCB Assembly and PCB fabrication facilities and took initiative for automating internal processes for better efficiency using VBA scripts.

Software Developer, Blackberry
Waterloo, ON — Sept-Dec 2012

Worked as a developer for the Duplicate Defect Detection (DDD) research project. Gained research experience in Information retrieval techniques and search engines, and also learnt about wireless communication systems and BlackBerry carrier infrastructure.

Accomplishments
- Successfully developed the following DDD tools in Java:
  - Exception Sender: tool to inspect the performance of DDD system every time it runs. If DDD was not running as expected, Exception Sender notified the concerned people about the issues encountered by DDD.
  - Bug Extractor: tool to improve the performance of DDD. It extracted the new bugs filed in MKS Integrity (bug reporting system) at 15min intervals and indexed them into an index file. This improved the accuracy of information during a search.
- Tested and Verified builds and virtual environments for BlackBerry Internet Service (BIS).
- Used various testing tools to inspect logs to resolve the issues found during verification.

Software Engineer, Phoenix Interactive Design Inc.
London, ON — Jan-April 2012

Followed a rigorous design process (software specifications, design documentation, test plans, software coding (C++) and integration) to develop and implement new feature functionality. Was

trained in Agile project development, participated in daily scrums and sprint planning meetings.

Accomplishments
- Successfully developed automated teller machine (ATM) applications and presented them to the senior management:
    - Asset Manager: tool to track assets and update the assets database on addition or removal of devices like pin-pads, receipt printers etc., on an ATM terminal.
    - On-Screen Keyboard: a virtual touch screen keyboard displayed on the ATM screen, which can be used as an alternative to the physical pin-pad.
- Tested the applications on ATM hardware, Virtual Machines & Desktop Simulators.

Engineering Software Tools Administrator, Christie Digital Systems
Kitchener, ON — May-August 2011

Collected information relating to software tools and Electrical System Parts in extensive databases. Also reviewed and corrected part specifications of Electronic Components to ensure accuracy of information prior to importing into Product Lifecycle Management (PLM) System.

Accomplishments
- Successfully redesigned the User Interface of the PLM system to provide better and quick search criteria.
- Planned, designed and delivered a Technical Presentation to train the developers in the new UI (user interface) functionality.

Awards

QEII-Graduate Scholarship in Science and Technology - $15000
2016 - 2017

President's Graduate Scholarship, University of Waterloo - $5000
2016 - 2017

Undergraduate Student Research Award, NSERC - $4500
Spring 2015

Undergraduate Research Assistantship, University of Waterloo - $800
Winter 2015

Gerry Heckman Scholarship - $3000
Winter 2015

Baylis Medical Capstone Design Project Award - $1250
Spring 2014

Ontario Power Generation Engineering Award - $2400
September 2011 - 2012

Ontario Professional Engineers Foundation Undergraduate Scholarship - $1250
September 2011 - 2012

Awarded UW merit scholarship, University of Waterloo - $1000
September 2010

Honours

4 x Dean's Honours List for academic distinction, University of Waterloo
Fall 2010, Spring 2012, Winter 2013, Winter 2015