Bhargava Manja

September 6, 2016

Interested in computer vision, machine learning, and robotics

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manja.xyz

Education

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  BSc, Mathematics and Computer Science — *2012 - 2016*
  - Graduating December 2016
  - Cum. GPA: 3.89/4
  - James Scholar
  - Dean's List, all semesters

Research Experience

- **Bretl Robotics Group** — Research Assistant
  Prof. Timothy Bretl — *January 2014 - present*
  - Develop vision algorithms for autonomous monitoring of construction sites by drone
  - Develop machine learning/computer vision techniques for augmented control of myoelectric prosthetic hands

- **Runtime Verification** — Urbana, IL
  Researcher/Software Engineer — *April 2015 - Present*
  - Help commericialize Prof. Grigore Rosu's formal verification research
  - Apply cutting edge runtime verification techniques to vehicle embedded software/hardware controllers
  - Develop real time embedded software and reverse engineer CAN protocols
  - Work has been demoed for Toyota researchers, General Motors executives, and the National Science Foundation
  - Co-wrote a DOD grant proposal, multiple NSF SBIR project reports, and am responsible for a NSF research project

- **Formal Systems Lab** — Research Assistant
  Prof. Grigore Rosu — *February 2014 - Present*
  - Added rewrite rules to the K semantic framework to automatically optimize common code patterns
  - Develop framework for automatic generation of provably correct runtime software monitors from formal specification

- **Election Analytics Group** — Research Assistant
  Prof. Sheldon Howard Jacobson — *October 2012 - May 2013*
  - Wrote poll scraper, web page, and implemented parts of Prof. Jacobson's algorithm for election snapshot generation
  - Correctly predicted 35/36 Senate seats correct in 2014 Senate races, correctly predicted electoral results in all but one state (Florida) in 2012 Presidential race
  - Work featured in the Wall Street Journal, Slashdot, and the Daily Kos, among others

Publications

- *RV-ECU: Maximum Assurance In-Vehicle Safety Monitoring*; Philip Daian, **Bhargava Manja**, Shinichi Shiraishi, Akihito Iwai, Grigore Rosu. SAE16 World Congress 16AE-0158, Safety Critical Systems.

- *Automatic Grasp Selection using a Camera in a Hand Prosthesis*; Joseph DeGol, Aadeel Akhtar, **Bhargava Manja**, and Timothy Bretl. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society ***3rd Place in Student Paper Competition***

Work Experience

- **Grokable** — Palo Alto, CA
  Research Engineer — *May 2016 - August 2016*
  - Research and develop brain inspired learning algorithms for computer vision
  - Work required reading recent papers in deep learning, machine learning, and neuroscience and applying/implementing cutting edge techniques

- **CS 460 (Computer Security Lab)** — Urbana, IL
  Grader/Lab Assistant — *January 2015 - May 2015*
  - Graded lab assignments
  - Answered student questions during lab hours

- **Upthere** — Palo Alto, CA
  Software Engineering Intern — *Summer 2014*
  - Built public file sharing for UpThere's cloud storage product
  - Designed and implemented the authentication and authorization system, and blacklist system for illegal/copyrighted content
  - All code was reviewed and pushed to production

- **VMWare** — Palo Alto, CA
  Software Engineering Intern — *Summer 2013*
  - Built automated deployer for arbitrary virtual network topologies in Openstack
  - Expanded scope and flexibility of testing by porting a Python testbed to Openstack cloud

- **NCSA** — Urbana, IL
  Undergraduate Research Programmer — *October 2012 - May 2013*
  - Refactored Java data analysis software (which was unusable before)
  - Wrote Scala web application for stem cell researchers to input, process, and visualize experimental data

- **Riverbed Technology** — San Fancisco, CA
  IT person/QA Engineer — *Summer 2012*
  - Started as IT desktop support preparing laptops and processing returns
  - automated away much of my work, built kiosk for automating support requests
  - subsequently promoted to QA engineer, wrote UI tests in Python

Grants & Scholarships

- **ISUR Scholarship**: Undergraduate research grant amounting to $1200, awarded for myolelectric hand project. Sponsored by Silicon Research Corporation. Funds used to buy 3D camera

- **James Scholar Preble Scholarship**: Research grant awarded for continuation of myoelectric hand project, total award $500, used to buy embedded GPU device for faster image classification.

Competitions

- **Microsoft Student OS Competition**   2nd Place
  ECE 391   *December 2013*
  - Microsoft sponsored operating system competition in ECE 391, capstone ECE systems course
  - Got 100% on final Unix-like operating system, then implemented a basic windowing system
  - Won >200$ worth of prizes

- **CS 460 Attack Defend**   1st Place
  Security Lab   *April 2014*
  - Final project in security lab - 1 week to defend a cluster of networked machine, 1 week to attack all other groups, first place awarded to most succesfull hackers
  - ARP spoofed whole lab, used backdoored OpenSSH to collect SSH passwords, hacked all but one team

Technical Skills

- **Programming Languages (experienced)**: C, C++, Java, OCaml, Python

- **Programming Langauges (intermediate)**: Scheme, MIPS, x86, Matlab

- **Libraries and Frameworks**: OpenCV, ROS, Caffe

Other

- **Association for Computing Machinery**: Member of largest student ACM chapter. Revived and now lead the special interest group for robotics (SIGbot), for which I give lectures and fund and advise projects.

- **Amateur lampworking**: Founding member and treasurer of glassblowing club. Torchwork with glass to make pendants, pipes, etc.

- **Boxing Club**: Boxing for 1 year