Michael Koval mkoval@cs.cmu.edu · mkoval.org

Education

Carnegie Mellon University — Pittsburgh, PA
Ph.D., Robotics — August 2012 – Present

Rutgers University — New Brunswick, NJ
B.S., Electrical and Computer Engineering — September 2008 – May 2012
B.S., Computer Science (double major)

- Graduated *summa cum laude* with 165 credits and a 3.99 GPA
- Completed graduate courses in Artificial Intelligence and Convex Optimization
- Design Project: Vision-Based Intelligent Ground Vehicle (for IGVC 2011)

Experience

Carnegie Mellon University — Pittsburgh, PA
Research Assistant, Personal Robotics Laboratory — June 2012 – Present

- Contributed to research on object search via manipulation in cluttered scenes
- Implemented and validated several novel planners in OpenRAVE simulations
- Preparing a conference paper for submission to ICRA 2013

Microsoft Corporation — Redmond, WA
SDE Intern, Bing Geospatial R&D Group — June 2011 – September 2011

- Researched how to efficiently querying histograms over geospatial regions
- Implemented an index and caching scheme for the live geospatial index
- Presented my results in two talks, including the Bing Platforms Tech Talk

Department of Defense
Intern, Computer Science Research Group — May 2010 – August 2010

- Developed a domain-specific segmentation algorithm using machine learning
- Designed and implemented custom feature extractors for object identification
- Collaborated closely with contractors who had extensive domain-specific expertise
- Presented work to the research group and authored an internal technical report

University of Central Florida — Orlando, FL
Research Assistant, AMALTHEA REU — May – July 2010

- Member of the Machine Learning Lab (ML^2), advised by Dr. Michael Georgiopolous
- Researched a graph-based target recognition algorithm for multi-agent systems
- Simulated the algorithm by developing custom plugins for the Stage simulator
- Co-author of a conference paper submitted to ICRA 2010 for review

Activities

Rutgers University — New Brunswick, NJ
President, IEEE Student Branch — Spring 2009 – Summer 2012

- Leader of the 2012 Intelligent Ground Vehicle Competition (IGVC) team
- Leader of the 2009 and 2010 Vex Robotics College Challenge Competition teams
- Developed the perception and vision algorithms used for IGVC 2011 and 2012
- Implemented the localization and planning algorithms used for IGVC 2012

Rutgers University — New Brunswick, NJ
Research Assistant, RL^3 Laboratory — Fall 2010 – Spring 2011

- Researched how to use reinforcement learning to control a quadrotor helicopter
- Assisted with experimental setup for an AR.Drone and Vicon motion tracking system
- Studied policy search for robotics applications, advised by Dr. Michael Littman

Rutgers University — New Brunswick, NJ
Peer Leader, Computer Science Department — Fall 2009 – Spring 2012

- Taught 1-2 weekly recitations for Introduction to Computer Science

Open Source

Extended Kalman Filter for Outdoor Localization 2012
- ▷ Repository: https://github.com/mkoval/robot_kf
- □ Filter to fuse odometry, GPS, and a digital compass for outdoor localization

PNI Fieldforce TCM Digital Compass Driver 2011–2012
- ▷ Repository: https://github.com/mkoval/FieldforceTCM
- □ ROS wrapper for the PNI Binary Protocol used by PNI's RS-232 digital compasses

TI MDL-BDC-24 Speed Controller Driver 2011–2012
- ▷ Repository: https://github.com/mkoval/jaguar
- □ ROS wrapper for the MDL-BDC-24 CAN-bus brushed DC motor controller

Hardware Abstraction for Vex (HAX) 2009–2010
- ▷ Repository: https://github.com/mkoval/hax
- □ Provides a common interface and cross-platform toolchain for Vex microcontrollers

Skills

Languages	C, C++, C#, Python, Java, Scala, Scheme, Verilog
Libraries	Boost, Eigen, ROS, OpenCV, PCL, OpenRAVE, NumPy, Matplotlib
Software	Git, SVN, MATLAB, EAGLE, Gnuplot, GraphViz
Electronics	AVR, ARM, and PIC development

Awards

- □ Rutgers University Presidential Scholarship (four years)
- □ Edward J. Bloustein Distinguished Scholar (four years)
- □ Noe, James, and Edna Memorial Scholarship (twice)
- □ Robotics Design Team Award (twice)
- □ Steve and Cynde Magidison Award
- □ Hannah Sands Memorial Scholarship
- □ Steven Petrucelli Scholarship
- □ Donald R. Knapp Memorial Scholarship

Competitions

- □ Intelligent Ground Vehicle Competition, Second Place in Design Competition (2012)
- □ Vex Robotics Competition World Championship, Innovate Award (2010)
- □ Vex Robotics Competition BEYA Conference, Judges Award (2010)
- □ Morningstar Programming Competition Winner (2011 and 2012)