

Research Interest My research interests lie primarily in robotics. I'm particularly interested in motion planning under uncertainty, especially in complex, partially unknown environments.

Education **University of Minnesota** 2013 – Present
Ph.D. Student
Advisor: Stephen J. Guy
GPA: 3.88

Carleton College 2009 – 2013
Bachelor of Arts in Computer Science
Graduated with Distinction
Major GPA: 3.81 (Total GPA: 3.52)

Work Experience **University of Minnesota** Teaching Assistant
Minneapolis, MN 2013 – Present
TA for Algorithms and Data Structures (four semesters) and Discrete Math (one semester).

Epic Systems Corporation Software Development Intern
Verona, WI June 2012 – August 2012
Designed and implemented a mobile app endpoint for waitlisted appointments.
Created a location based search engine.

Utah State University REU Participant
Logan, UT June 2011 – August 2011
Designed and developed a content-based image retrieval system.

Thomson Reuters Technology Intern
Eagan, MN Summer 2009 & 2010
Developed server endpoint tests. Created a performance testing suite.

Publications **Coverage Aware Trajectory Optimization**
Introduced the problem of continuous, coverage-aware trajectory optimization under localization and sensing uncertainty and developed an algorithm to find locally optimal coverage paths.

Bobby Davis, Ioannis Karamouzas, and Stephen J. Guy. *Under Submission to RA-L/ICRA*

Data-Driven Story Domain Inference for Computer Narrative Generation
Proposed a data-driven narrative generation method that employs a Bayesian inference approach to learn high-level story domains from collections of existing stories.

Bilal Kartal, Bobby Davis, and Stephen J. Guy. *Under Submission*

Content-Based Image Retrieval
Designed a system which, given an input image, returns images from a database that are *semantically* similar to the input image.

Robert Davis, Zhongmiao Xiao, and Xiaojun Qi, "Capturing Semantic Relationship Among Images in Clusters for Efficient Content-Based Image Retrieval" IEEE Int. Conf. on Image Processing (ICIP'12), pp. 1953-1956, Sept. 30-Oct. 3, Orlando, Florida, 2012.

Projects **2D SLAM** Spring 2014
Designed and developed a 2D SLAM algorithm on a differential drive robot equipped with a 2D laser scanner, in a small group.

Baxter Cube Stacking Fall 2013
Developed and implemented a cube stacking algorithm on a Rethink Robotics Baxter robot, using OpenCV and ROS as part of a small group.

Neural Network Weather Prediction Winter 2012 – 2013
Designed and implemented a short term weather prediction algorithm, utilizing the NOAA

weather archive and neural networks, with a small group.

Qualifications

Programming Languages: C++, Python, Java, C#

Libraries and Tools: ROS, OpenCV, OpenGL, GCC, GDB, MATLAB, Linux

Activities

Peer Review Service

Fall 2013 – Present

IEEE T-ASE, AAI, IEEE/RSJ IROS

Carleton Game Development Club

Fall 2011 – Spring 2013

Worked in a small team to create one game per semester.

Vice president Fall 2012 – Spring 2013.