

Ivan Kirigin

ivan.kirigin@gmail.com

(617) 777-4317

10 Skehan St, Somerville, MA 02143

www.kirigin.com

Objective

To work in a fast-paced and engaging environment developing advanced robotics and computer vision applications resulting in successfully deployed systems.

Work Experience

Charles River Analytics Scientist, Computer Vision Division

February 2005 - Present

Applying cutting-edge research to create solutions for real world problems using both Matlab for rapid prototyping and C++ for real-time, optimized and deployable systems.

Additional responsibilities include: proposal writing; managing interns; coordinating with multiple subcontractors; maintaining, adapting, and expanding upon legacy code.

VANESSA: Video Aided Nighttime Surveillance and Situational Awareness

This Phase II Small Business Innovative Research (SBIR) grant is a real-time surveillance system which operates under difficult nighttime conditions. Components include image enhancement & smoothing; detecting motion, pedestrians, and headlights; tracking regions using a particle filter; detailed logging; and evaluation. This project requires researching sensors, integrating third party libraries, and coordinating with multiple subcontractors.

SESAME: Scene Estimation & Situational Awareness Mapping Engine

This Phase II SBIR involves building a multi-resolution volumetric map of a scene from online camera data on a moving robotic platform. Data extracted from the scene yields, for example, vehicle models and license plate numbers in a parking lot. This project requires managing legacy inter-process communication through NML, interfacing with ARIA (Active Media's robot control API), and implementing a cost-constrained, enhanced powering system.

Carnegie Mellon University Research Assistant, Robotics Institute

June 2003 – December 2004

Developed applications for vision on mobile robots in the Field Robotics Center with my advisor, Sanjiv Singh. Devised new techniques to tackle unsolved problems.

Work ran parallel to coursework for the MS in Robotics program and incorporated and expanded upon the newest research techniques.

Visual Odometry on RHEX

RHEX is a robotic hexapod which is highly robust in unconstrained, real world environments. Developed a real-time navigation system using both cameras and inertial sensors which is reliable under the extreme motions of the platform.

Intrinsic Camera Calibration Toolkit

Created an intuitive and unified interface for intrinsic camera calibration for Athena Technologies Inc. which enabled both completion of a calibration task in minutes and in-field re-calibration.

KLT tracking with rotation

Developed complete feature tracking system for rigid image motion based on the Kanade-Lucas-Tomasi tracker. This real-time tracker significantly enhanced tracking performance for systems with significant roll, especially where inertial measurements are available.

Education

**Carnegie Mellon University
Robotics Institute**

June 2003 – December 2004

Master of Science in Robotics
G.P.A. 3.7

Coursework Including

Computer Vision
Advanced Perception
Machine Learning
Mathematical Fundamentals for Robotics
Mobile Robot Systems
Mobile Robot Programming
Robotic Manipulation
Introduction to Entrepreneurship

**New York University
College of Arts and Science**

September 2001 – June 2003

Bachelor of Arts:
Computer Science with Honors
Minor: Mathematics
G.P.A. 3.74

Software Engineering Project Leader

Created a model of complex adaptive systems through an XML-configurable, interactive, multi-threaded Java program that simulated agent-agent and agent-environment interaction.

Computer Vision Toolkit

Created in Java, this suite included image component measurements, feature detection, contour detection, and depth from stereo vision.

**University of California at
Los Angeles
College of Letters
and Science**

September 1999 - June 2001

National Merit Special Scholarship

September 1999 - June 2003

Skills

C++: STL, Real-Time Systems, Image Processing, OpenGL, Windows and Linux

Java: Swing, Servlets, JSP, Threads, Events, Object-oriented analysis and design

Matlab: Rapid prototyping & algorithm validation, Image Processing toolkit, GUIDE

Other Language Experience: Mathematica, Ada95; Assembly: x86, MIPS, JVM

Tools: Cygwin, AccuRev, CVS, QT 3 & 4, ImageJ, GCC, GDB, MSVC.NET, Eclipse, JUnit

Interests: Zero-sum games: Go, chess, RISK, poker; guitar, racquetball, blogging, Japanese language, Fluent in Croatian