

Pushkar Kolhe

#Robotics and Intelligent Machines Center
Georgia Institute of Technology
Atlanta, GA

404-345-6778
[pushkar \[at\] cc.gatech.edu](mailto:pushkar@cc.gatech.edu)
<http://www.pushkar.name/>

Education

Georgia Institute of Technology

Ph.D., Computer Science

– Advisors: Dr. Henrik Christensen, Dr. Mike Stilman

Atlanta, GA

Aug. 2010 - present

Georgia Institute of Technology

M.S., Computer Science (GPA: 3.69)

– Advisors: Dr. Mike Stilman, Dr. Tucker Balch

Atlanta, GA

Aug. 2007 - May. 2009

Mumbai University

B.E., Computer Engineering (GPA: 3.7)

Mumbai, India

Aug. 2003 - May. 2007

Work Experience

Georgia Institute of Technology

Research Scientist with Dr. Henrik Christensen

- Research in robot control, perception, mapping and object recognition in manufacturing and palletizing.
- Software Development for the open source simulator, USARSim and organize the VMA competition at ICRA 2010.

Atlanta, GA

July 2009 - present

Toyota Research Institute

Technical Research Intern

- Research in Computer Vision and Machine Learning in Robotics and self-learning agents.
- Research in developing a 3D laser sensor and camera system for vehicle and people detection.

Ann Arbor, MI

Aug. 2008 - Dec. 2008

CRAB Lab, Dept of Physics, Georgia Tech

Research Technician

- Developed vision based tracking systems and designed experiments.

Atlanta, GA

Aug. 2007 - Jul. 2008

TRI Technosolutions Pvt. Ltd.

Robotics Software Engineer

- Developed software for use in educational robotics.

IITB, India

Jun. 2007 - Jul. 2007

Publications

“Dynamic Pushing Strategies for Dynamically Stable Mobile Manipulators.” Pushkar Kolhe, Neil Dantam, Mike Stilman, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA 2010)*, May 2010.

Research Projects

Perception strategies for humanoid robots

- Designing a sensor fusion system of the MESA range sensor and cameras for humanoid perception.
- Perception involves plane fitting and object model fitting for grasping.

Fall 2009-present

Sparky, prototype humanoid robot

- Designing a non-holonomic two-wheeled balancing manipulator robot.
- Study of dynamics and state estimation of this humanoid robot.

Spring 2009 - Summer 2009

Robocup Nao League 2008

- Participated in the humanoid robosoccer league in Suzhou, China 2008 with GT and CMU team.
- Worked on the perception system for the Nao robot. Also, designed localization system that is independent of Robocup markers.

Fall 2007 - Summer 2008

- Worked on multi-robot communication protocol and designing team strategy in robots.

Mobile Manipulation

Spring 2008

- Worked on a mobile manipulator platform of Segway and the KUKA LWM for picking up a CD and playing it in a CD player.
- Designed machine learning based perception system for detecting and tracking CD and the CD player.

Multi-robot Systems

Spring 2008

- Developed a communication model for multi-robot systems with which a goal task can be achieved by a multiple robot systems in groups. The protocol was designed specially to consider robots with limited or faulty sensors.

IDE for Robot Programming

Spring 2008

- Designed a scripting language for programming robots with subsumption architecture.
- Language also supported sensor-based learning programming at the hardware level.

Prithvi 2, An Industrial Research Platform

Spring 2008

- Designed vision based perception systems for an industrial grade robot designed and constructed in our lab.

Technical Projects

USARSim Simulator

Fall 2009

- Open source development of the Unreal Engine based USARSim simulator.

RST

Fall 2009

- Designing physics engine for an OpenGL based simulator for humanoid robotics.

IPC architecture

Spring 2009

- Designing a IPC framework for use with robots. The framework can extend over a TCP network and supported real time systems and could gracefully soft crash.

CPLD based mobile robots

Spring 2005

- Designed a CPLD XC 9536 based robot with Optical IR Sensors that could follow a white line using the Xilinx Webpack.

Awards

Second Position in Robocup Nao League 2008. 2008
 Third prize for best project exhibited at International Level exhibition of IEEMA, Elecrama. 2006
 Third position in national level of the ABU Robocon competition. 2007

Skills

Languages: C, C++, MATLAB, Visual C++, Visual C#, Lisp, Python, Unreal Script

Operating Systems: Linux (Debian, Fedora, Gentoo), Windows

Microcontrollers and Embedded Systems: Atmel AVR microcontrollers (AVR 8, AVR 16 and AVR 32), Xilinx XC9536 CPLD.

Robots: P3AT, iRobot Create, TRI iBot, CRS A465, Kuka LWM, Segway RMP 200, NAO
 Designed inhouse: Prithvi2, Sparky, Golem Krang

Interests

Membership: Student member of IEEE RAS

Hobby Projects: Mini UAV Design, visit website for more details

Other: Rubiks Speed Cubing (60 seconds), Cricket, Soccer, Photography, Web-designing.

References

Dr. Henrik Christensen

Professor

Georgia Institute of Technology

Atlanta, GA, USA

[Web](#)

Dr. Mike Stilman

Assistant Professor

Georgia Institute of Technology

Atlanta, GA, USA

[Web](#)

Dr. Danil Prokhorov

Manager, Research Scientist

Toyota Technical Center

Ann Arbor, MI