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Stefan Hrabar

OBJECTIVES

Having conducted research on vision-based 3D navigation for an autonomous helicopter in the Robotics Research Lab at the University of Southern California, I aim to pursue a career in robotics, and more specifically in the fields of Unmanned Aerial Vehicles and computer vision. I have a passion for robotics as this field allows me to draw on my Mechanical Engineering and Computer Science degrees and expertise.

EDUCATION

2003 – present: PhD in Computer Science, University of Southern California (expected to complete by January 2006)

2001 – 2003 Masters in Computer Science – Robotics and Intelligent Systems, University of Southern California
- (3.62 GPA)

2000 – 2001 Masters in Mechanical Engineering, University of Cape Town
B.Sc. in Computer Science (1st and 2nd year), University of Cape Town

1993 – 1996 B.Sc. in Mechanical Engineering, University of Cape Town
- Graduated with Honors

WORK AND RESEARCH EXPERIENCE

March 2003 – present: Project Specialist, USC Robotics Research Lab.
- Research in 3D navigation for an Unmanned Aerial Vehicle
  - Including: Optic-flow and stereo vision-based techniques, 3D path planning
- System design, integration and maintenance of the USC UAV.

July & August 2004: Research internship at CSIRO in Brisbane, Australia
- Conducted research on vision-based obstacle avoidance techniques for an autonomous tractor, including stereo vision and optic flow.

August 2001 – Feb 2003: Graduate Research Assistant in USC Robotics Lab
- Research in Omnidirectional Vision for an Unmanned Aerial Vehicle
- Construction of an autonomous helicopter

Continued…

2000 – 2001 Department of Mechanical Engineering, University of Cape Town

- Research into material to be used in an introduction to robotics course, including sensors, actuators and control boards.
- Construction of an Animatronic Aardvark for use in a National Geographic wildlife film.

1997 - 1998 WS Atkins Consulting Engineers, London.

- Building and testing of GIS based water supply network models. Extensive use of CAD, GIS and modeling software.

1996 Department of Mechanical Engineering, University of Cape Town

- 4th year thesis project – design and control of an automated warehouse packing system. Working scale model built

TEACHING EXPERIENCE

Aug – Dec 2005: Instructor for undergraduate Robotics course at the University of Southern California (CSCI 445 – Introduction to Robotics)

2001: Teaching Assistant for undergraduate Robotics course at the University of Southern California (CSCI 445 – Introduction to Robotics)

TECHNICAL SKILLS

Programming: C, C++, Java, html, XML, SQL, Matlab

Operating Systems: Linux, QNX, Windows, Mac OS X

Extensive experience with Intel's OpenCV Computer Vision Library

Computer hardware installation and maintenance including PC104

Workshop: Welding, machining, electronics prototyping, soldering

CAD design: AutoCAD, Solid Works

Other software: 3D Studio Max, Adobe Premier, DVD Authoring

AWARDS RECEIVED

2004 USC AVATAR project wins the PC/104 Embedded Consortium's PC/104 Design Contest.

2002 Computer Science Department Outstanding Teaching Assistant Award

1993 - 1996 Hyman Lieberman Scholarship

1994 - 1996 Dean's Merit List

PUBLICATIONS

Stefan E. Hrabar, Peter I. Corke, Gaurav S. Sukhatme, Kane Usher, and Jonathan M. Roberts, "**Combined Optic-Flow and Stereo-Based Navigation of Urban Canyons for a UAV**," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp 302 – 309, 2005

Stefan E. Hrabar and Gaurav S. Sukhatme, "**A Comparison of Two Camera Configurations For Optic-Flow Based Navigation of a UAV Through Urban Canyons**," In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 2673 - 2680, Sep 2004

Peter I. Corke, Stefan E. Hrabar, Ron Peterson, Daniela Rus, Srikanth Saripalli, and Gaurav S. Sukhatme, "**Autonomous Deployment and Repair of a Sensor Network using an Unmanned Aerial Vehicle**," in *IEEE International Conference on Robotics and Automation*, pp. 3602-3609, Apr 2004

Peter I. Corke, Stefan E. Hrabar, Ron Peterson, Daniela Rus, Srikanth Saripalli, and Gaurav S. Sukhatme, "**Deployment and Connectivity Repair of a Sensor Net with a Flying Robot**," in *9th International Symposium on Experimental Robotics*, 2004

Stefan E. Hrabar and Gaurav S. Sukhatme, "**Omnidirectional Vision for an Autonomous Helicopter**," In *IEEE International Conference on Robotics and Automation*, pp. 558 - 563, 2003.

Hrabar, S and Sass, A (2002) **Design and Control of an Animatronic Aardvark**, The American Society of Mechanical Engineers magazine: Mechanical Engineering

Hrabar, S and Sass, A (2001) Full Dissertation: **Design and Control of an Animatronic Aardvark**

Hrabar, S and Nurick, G (1996) Thesis report: **Design and Control of an Automated Warehouse Packing System**