Olivier Koch

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PhD Candidate in Computer Science

OBJECTIVE

Obtain an academic research position in the fields of computer vision and robotics. I am particularly interested in the application of computer vision to mapping and navigation for robots and humans.

EDUCATION

MIT, CSAIL, PhD **expected October 2009**

- Thesis title: A Self-Calibrating Vision-Based Method for Human-Oriented Navigation
- Advisor: Prof. Seth Teller – Committee: Prof. William Freeman, Prof. Rob Miller

MIT CSAIL, Master of Science, GPA 4.6/5.0 **Feb 2007**

- Thesis Title: Wide-Area Egomotion from Omnidirectional Video and Coarse 3D Structure
- Courses: Computer vision, Theory of Computation, Computer Graphics, Distributed Systems

Ecole Nationale Supérieure de Techniques Avancées (ENSTA) **1999-2002**
French Engineering Diploma

- Major: Operating systems/Parallel computing/Networks/Cryptography
- Research project: Parallel computing on the City Scanning Project, MIT (Prof. Seth Teller)

RESEARCH EXPERIENCE

MIT, CSAIL, Cambridge, USA **Research Assistant, 2007 - now**

- Investigated methods for topological navigation using vision (advisor Prof. Seth Teller)
- Designed and built a wearable multi-camera rig using Firewire cameras and embedded portable computers to develop and test the algorithms
- Software and related paper available at `http://rvsn.csail.mit.edu/navguide`

INRIA (Institut National de Recherche en Informatique et Automatique), Grenoble, France **Intern, Jun - Oct 2007**

- Collaboration with Prof. Peter Sturm during my PhD
- Developed new methods for 3D patch reconstruction using structure-from-motion
- Produced a ground-truth database of simulated video sequences and 3D camera paths

MIT, CSAIL, Cambridge, USA **Research Assistant, 2004 - 2006**

- Designed and developed new methods for alignment of 2D lines on a 3D model
- Implemented and tested the algorithms on the Pointgrey Ladybug omnidirectional camera
- Coordinated team of three students on the Building Modeling Group (BMG) which goal is to build a detailed 3D indoor map of the MIT campus
- Software and related paper available at `http://rvsn.csail.mit.edu/omni3d`

MIT CSAIL, Darpa Urban Challenge **Team member, Feb 2006 - Nov 2007**

- Developed an application for mission and map editing allowing live overlay of satellite images
- Contributed to the development of techniques for laser-based navigation
- Assisted the team with code infrastructure and regression testing

General Electric Healthcare, France **Software Engineer, Oct 2002 - Oct 2004**

- Designed and developed applications for digital Xray machine Innova 4100
- Collaborated in a strong multi-team environments
- Completed Six Sigma Green Belt certification by decreasing system startup time by 50%
- Discussed solutions with technical leaders and implemented them using design patterns
- Managed the Environment, Health and Security program of the team ($10,000 budget)

MIT Lab for Computer Science (LCS), Cambridge, USA **Intern, Mar - Aug 2002**

- Research internship for my engineering degree at ENSTA – advisor Prof. Seth Teller
- Mapped the plane sweep algorithm on an heterogeneous cluster of 20 IRIX machines, achieving a speedup factor of 15
- Analyzed overall performance of the system and diagnosed computational bottlenecks
- Assisted a PhD student on camera calibration and epipolar geometry problems

PUBLICATIONS

A Self-Calibrating, Vision-based Navigation Assistant, Olivier Koch, Seth Teller, *European Conference on Computer Vision (***ECCV***), Workshop on Computer Vision Applications for the Visually Impaired*, October 2008, France

Wide-Area Egomotion Estimation from Known 3D Structure, Olivier Koch, Seth Teller, *Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2007

TALKS

A Self-Calibrating, Vision-Based Navigation Assistant, International Conference on Intelligent Robot and Systems (IROS), Workshop on 3D Mapping, France, 2008 (*invited by Prof. Wolfram Burgard*)

Wide-Area Localization from Omnidirectional Video and Known 3D Structure, INRIA Rhônes-Alpes, France, 2007 (*invited by Prof. Peter Sturm*)

TEACHING

6.01 Introduction to EECS 1, Teaching Assistant **Spring 2008**

- Co-supervised 120 hours of labs with sections of 100 students
- Prepared 60 hours of hardware labs and interacted intensively with students

6.092 Introduction to Software Engineering in Java, Instructor **2008 & 2009**

- Runs over four weeks in January; targeted to a wide audience at MIT
- Prepared and gave 12 hours of lectures and the corresponding assignments

ORGANIZATIONS & COMMITTEES

Reviewer

- IEEE Transaction on Robotics, Special Issue on Visual SLAM, October 2008
- MIT CSAIL Student Workshop (CSW), 2007

Affiliations

- Institute of Electrical and Electronics Engineer (IEEE)

EXTRA-CURRICULAR ACTIVITIES

- Directed the MIT Club Francophone, 400 members, 2006-2007
- Launched and developed the Energy Regatta at MIT, $10,000 budget, 2006-2008

REFERENCES

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