

Todd A. Williamson

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OBJECTIVE

I am seeking a Ph.D. level research and/or research management position. My primary research experience is in computer vision and localization, and applications in robotics and medicine. I believe in investigating problems from first principles (basic mathematics and physics), and carrying those ideas through to actual working applications.

EDUCATION

- Ph.D.** (9/98) **Robotics**, Carnegie Mellon University.
Project: Automated Highway Systems, Navlab
Thesis topic: A High-Performance Stereo Vision System for Obstacle Detection.
Advisor: Dr. Charles Thorpe
- M.S.** (5/94) **Robotics**, Carnegie Mellon University.
Project: Unmanned Ground Vehicle (UGV), Navlab
Advisor: Dr. Charles Thorpe
- B.S.** (5/91) **Applied Mathematics (Computer Science)**, Carnegie Mellon University
- B.S.** (5/91) **Physics**, Carnegie Mellon University
(with honors)

PROFESSIONAL EXPERIENCE

- 11/00–present **Vice President, Research and Development**, Zaxel Systems, Inc.; Pittsburgh, PA
In addition to the responsibilities listed below, also responsible for developing new products and mapping out the future directions of the company. Responsible for IP policy, in particular patent applications.
- 2/00-11/00 **Chief Architect**, Zaxel Systems, Inc.; Pittsburgh, PA
(<http://www.zaxel.com>) My job was to design and implement Zaxel's Virtual Viewpoint technology. This technology allows an event to be captured in 3D, using a number of video cameras arrayed around the space,. The event can then be viewed from any viewpoint within the space. Responsibilities include supervision of several other researchers. I telecommute from my residence in Philadelphia.
- 7/99-1/00 **Manager, Image Analysis**, Cytometrics, Inc.; Philadelphia, PA
In addition to the responsibilities listed below, also acted as manager for a group of five Ph.D.-level researchers. Responsible for developing project plans and seeing them through to completion.
- 12/98-7/99 **Senior Image Analysis Scientist**, Cytometrics, Inc.; Philadelphia, PA
Cytometrics developed and patented a device to capture *in-vivo* images of the human microcirculatory system. Using these images it is possible to measure blood properties non-invasively. My research involved physical modeling of the optical properties of the tissue, segmentation of blood vessels, and statistical estimation of the desired quantities, including hemoglobin concentration and hematocrit. (Cytometrics has since gone bankrupt).
- 9/96-11/98 **Automated Highway Systems** (Ph.D. research), Carnegie Mellon University.
6/91-9/94 (<http://www.navlab.org/>) This project was part of the National Automated Highway Systems Consortium, the goal of which is to demonstrate technology that will be applied to automated and autonomous vehicles. My thesis focused on a method for detecting small obstacles at long range on the road surface in front of the vehicle.
- 9/94-9/96 **Indoor Mobile Robot Localization**, SECOM Co., Ltd.; Tokyo, Japan
The goal of this project was to use a single-camera vision system to provide very accurate localization for an indoor mobile robot. Our approach to the problem was to combine data from the robot wheel encoders with the locations of tracked image points using a Kalman filter. The system was able to compensate for the errors introduced by wheel slippage as long as enough image texture was present in the environment.

TEACHING EXPERIENCE

1/93-5/93

Carnegie Mellon University

Teaching Assistant for 15-212 Fundamental Structures of Computer Science II (sophomore level class). This class is an introduction to functional programming and the Scheme language. Responsible for several lectures, as well as leading two weekly recitation sections, developing problem sets and tests, and grading.

SELECTED PUBLICATIONS

- T. Williamson and C. Thorpe, “[A Specialized Multibaseline Stereo Technique for Obstacle Detection](#)”, *Proc. of IEEE CS Conf. Computer Vision and Pattern Recognition '98 (CVPR '98)*, IEEE CS Press, Santa Barbara, Calif., 1998.
- T. Williamson and C. Thorpe, “[Detection of Small Obstacles at Long Range Using Multibaseline Stereo](#)”, *Proc. of IEEE Intelligent Vehicles '98*, Stuttgart, Germany, Oct. 1998.
- T. Williamson and C. Thorpe, “[A Trinocular Stereo System for Highway Obstacle Detection](#)”, *Proc. of IEEE Int'l Conf. on Robotics and Automation '99 (ICRA '99)*, Detroit, Michigan, 1999.
- T. Williamson, “[A High-Performance Stereo Vision System for Obstacle Detection](#)”, doctoral dissertation, Robotics Institute, Carnegie Mellon Univ., Technical Report TR# CMU-RI-TR-98-24, Pittsburgh, 1998.
- M. Ollis and T. Williamson, “The Future of 3D Video”, *IEEE Computer Magazine*, vol. 34, no. 6, June 2001, pp. 97-99.
- S. Prince, A.D. Cheok, F. Farbiz, T. Williamson, N. Johnson, M. Billingham, and H. Kato, “Real-Time 3D Interaction for Augmented and Virtual Reality”, *Proc. IEEE CS SIGGRAPH 2002*, IEEE CS Press, San Antonio, Tex., 2002, pp. 238.
- S. Prince, A.D. Cheok, T. Williamson, N. Johnson, M. Billingham, H. Kato, and F. Farbiz, “3D Live: Real Time Captured Content for Mixed Reality”, to appear in *Proc. IEEE and ACM Int'l Symp. On Mixed and Augmented Reality (ISMAR '02)*, Darmstadt, Germany, Sept./Oct. 2002.
- S. Prince, T. Williamson, A. Cheok, F. Farbiz, M. Billingham, H. Kato, “3-D Live: Real-Time Interaction for Mixed Reality”, to appear in *Proc. ACM Conf. Computer Supported Cooperative Work (CSCW '02)*, Sheridan Printing, New Orleans, Nov. 2002.

AWARDS

National Science Foundation Graduate Fellow (1992-1997)

SKILLS

Fluent in spoken Japanese language.

REFERENCES

Available upon request.