

Andrew Neil Stein

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OBJECTIVE

Exciting career involving applications of computer vision, image processing, machine learning, and/or robotics, especially those enabling environmental/sustainability work, fundamental scientific research, space exploration, or personal assistive technologies.

EDUCATION

Carnegie Mellon University

Ph.D. Robotics

Pittsburgh, PA

February, 2008

M.S. Robotics

GPA: 3.96

August, 2004

Thesis:

Occlusion Boundaries: Low-Level Detection to High-Level Reasoning

Committee: Martial Hebert (chair), Alexei (Alyosha) Efros, Rahul Sukthankar, David Fleet

Fellowships:

National Science Foundation Graduate Fellow

National Defense Science & Engineering Graduate Fellow

Coursework:

Computer Vision, Machine Learning, Advanced Perception, Artificial Intelligence, Statistical Methods, Kinematics/ Dynamics/ Control

Teaching assistant for graduate course in Computer Vision (16-720), Fall 2003

Georgia Institute of Technology

Atlanta, GA

M.S. Electrical & Computer Engineering

GPA: 4.0

August, 2002

B.S. Electrical Engineering, with Highest Honor

GPA: 4.0

December, 2001

Scholarships:

Georgia Tech President's Scholarship, Georgia Governor's Scholarship, Robert C. Byrd Scholarship, Georgia Mining Scholarship, HOPE Scholarship

Awards & Honors:

Phi Kappa Phi Scholarship Cup – *most outstanding scholastic record of graduating class*

ECE Outstanding Senior Award, Henry Ford II Engineering Scholar, Golden Key Honor Society,

Order of the Engineer

Coursework:

Computer Vision, Signal/Image Processing, Embedded Microcontrollers, Probability & Random Signals, Systems & Controls, Microelectronics, VLSI & Digital Logic, Circuit Analysis

RESEARCH AND WORK EXPERIENCE

Tandent Vision Science

March 2008 - Present

Computer Vision Scientist

Pittsburgh, PA

ChemImage Corporation

Summer 2007

Summer Intern

Reporting To: C. Anderson, W. Hutchison

Pittsburgh, PA

Applied image processing and machine learning techniques to hyper-spectral, multi-modal pharmaceutical / medical imagery for auto-targeting and prostate cancer diagnosis.

NASA, Jet Propulsion Laboratory

Summer 2005

Summer Intern

Supervisor: L. Matthies

Pasadena, CA

Developed improved sub-pixel stereo disparity estimation approach.

Implemented and evaluated Belief Propagation Symmetric Stereo algorithm performance.

Intel Research Pittsburgh

Summer 2004

Summer Intern

Mentors: J. Campbell, R. Sukthankar

Pittsburgh, PA

Implemented online structure from motion (SFM) system in Matlab to reconstruct camera motion and environment structure from video data.

Georgia Tech Electrical Engineering Dept.

Sept. 2000 - Aug. 2002

Graduate Research Assistant

Advisor: A. Tannenbaum

Atlanta, GA

Designed, implemented, and tested real-time (109 fps) Bayesian segmentation and tracking algorithm for Air Force's Airborne Laser (ABL) missile defense system.

Investigated segmentation and tracking using active contours, level set methods, and Bayesian adaptive thresholding techniques.

Developed multi-target visual tracker for automated insect research (with T. Balch).

Princeton Summer Institute

Summer 2000

Research Intern

Advisor: P. Ramadge

Princeton, NJ

Applied gradient vector flow active contour methods to track Naval airplane landings from low quality, noisy video footage.

Georgia Tech IEEE Robotics Team

Sept. 1998 - Dec. 2000

Team Leader, 1999-2000

Advisor: Whit Smith

Atlanta, GA

Design of an autonomous robot for annual regional competition.

Project planning and organization, team management, and budgeting.

Experience with stepper and DC motors, servo control, analog and digital filters, various sensors, and embedded micro-controllers (MicroChip and Motorola)

Clipper Automation Corporation

May 1994 - Aug. 1997

CAD Manager

Cartersville, GA

Designed layout of automated sorting and conveying equipment using AutoCAD.

Developed software to calculate project costs directly from AutoCAD drawing files.

Traveled to industry trade shows and clients' installations.

SKILLS

Software:

Expertise with Matlab, particularly in rapid prototyping and visualization for computer vision, image processing, and machine learning.

Microsoft Visual Studio, Windows, and Office (esp. PowerPoint). Apple OS X. Photoshop. Aperture.

Programming Experience:

Primarily work in Matlab (including MEX) and C/C++.

Experience with Java and assembly for PIC microcontrollers.

Web page design in HTML, CSS Stylesheets.

Languages:

Proficient in Spanish, some working knowledge of German.

OTHER INTERESTS

Tennis, photography, acoustic guitar, travel, skiing, hiking, SCUBA diving.

PUBLICATIONS

- Stein and Hebert, "Occlusion Boundaries from Motion: Low-Level Detection and Mid-Level Reasoning," *International Journal of Computer Vision (IJCV)*, 2009.
- Stein, "Occlusion Boundaries: Low-Level Detection to High-Level Reasoning," *Doctoral Dissertation, Technical Report CMU-RI-TR-08-06, Robotics Institute, Carnegie Mellon University*, 2008.
- Stein, Stepleton, and Hebert, "Towards Unsupervised Whole-Object Segmentation: Combining Automated Matting with Boundary Detection," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2008. [Poster]
- Stein, Hoiem, and Hebert, "Learning to Find Object Boundaries Using Motion Cues," *IEEE International Conference on Computer Vision (ICCV)*, 2007. [Oral]
- Hoiem, Stein, Efros, and Hebert, "Recovering Occlusion Boundaries from a Single Image," *IEEE International Conference on Computer Vision (ICCV)*, 2007. [Oral]
- Stein and Hebert, "Combining Local Appearance and Motion Cues for Occlusion Boundary Detection," *British Machine Vision Conference (BMVC)*, 2007. [Oral]
- Matthies, Maimone, Johnson, Cheng, Willson, Villalpando, Goldberg, Huertas, Stein, and Angelova, "Computer Vision on Mars," *International Journal of Computer Vision (IJCV)*, 2007.
- Stein and Hebert, "Local Detection of Occlusion Boundaries in Video," *British Machine Vision Conference (BMVC)*, 2006. [Oral]
- Stein and Hebert, "Using Spatio-Temporal Patches for Simultaneous Estimation of Edge Strength, Orientation and Motion," *Beyond Patches Workshop at IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2006. [Oral]
- Balch, Dellaert, Feldman, Guillory, Isbell, Khan, Pratt, Stein, and Wilde, "How Multi-Robot Systems Research will Accelerate our Understanding of Social Animal Behavior," *Proceedings of the IEEE*, 2006.
- Stein, Huertas, and Matthies, "Attenuating Stereo Pixel-Locking via Affine Window Adaptation," *IEEE International Conference on Robotics and Automation (ICRA)*, 2006. [Oral, Finalist: Best Vision Paper]
- Stein and Hebert, "Incorporating Background Invariance into Feature-Based Object Recognition," *Workshop on Applications of Computer Vision (WACV)*, 2005. [Oral]
- Niethammer, Stein, Kalies, Mischaikow, Pilarczyk, and Tannenbaum, "Analysis of blood vessel topology by cubical homology," *International Conference on Image Processing (ICIP)*, 2002. [Poster]
- Stein, "Adaptive Image Segmentation and Tracking: A Bayesian Approach," Masters Thesis, Georgia Institute of Technology, 2002.