ALEXANDRU OCTAVIAN BALAN

Brown University Box 1910 | Email: alb@cs.brown.edu | Phone: (401) 699-9702
Providence RI, 02912 | Web Page: www.cs.brown.edu/~alb | Fax: (401) 863-7657

Research Interests

Geometric shape modeling, shape estimation and registration, 3D structure from images, multi-view vision, 3D photography, robotics, model-based articulated object tracking, probabilistic methods for approximate inference.

Education

Brown University, Providence RI *September 2003 – Present*

Ph.D. Candidate, Computer Science (expected graduation date: January 2010)

- Advisor: Dr. Michael Black
- Thesis topic: Detailed Human Shape and Pose from Images
- GPA: 4.0 / 4.0
- Relevant courses: 3D Photography and Geometry Processing, Articulated Human Tracking in Video, Forensic Computer Vision, Recent Applications of Probability and Statistics, Machine Learning, Brain Computer Interfaces

M.S., Computer Science, May 2005

Lafayette College, Easton PA *September 1999 – May 2003*

B.S. Honors, Computer Science

B.A. Honors, Joint degree in Mathematics and Economics

- Advisors: Dr. Lorenzo Traldi and Dr. Chun Wai Liew
- Thesis topic: Introduced a new generalized approach for evaluating a measure of the reliability of a network using Boolean algebra
- GPA: 3.98 / 4.0
- Graduated Valedictorian in a class of 655

Honors & Awards

- **Rosh Fellowship**, Brown University *Fall 2006*
- **Paris Kanellakis Fellowship**, Brown University *Fall 2003, Spring 2004*
- **Lafayette College Valedictorian** (highest GPA in the class – from 655 students) *May 2003*
- **Microsoft / UPE Scholarship Award** *Fall 2002*
- Third best Student Poster Presentation at the *ESCCC Conference*, Bloomsburg University, Bloomsburg PA *October 2002*

- Seven time winner of Lafayette College Benjamin F. Barge Mathematical Prize — *Between 1999-2003*
- Two time winner of the Lehigh Valley Association of Independent Colleges (LVAIC) Mathematics Contest — *1999 & 2001*
- Special Award at the National Competition of Computer Programming, Romania — *1996 & 1998*

Academic Experience

Teaching Assistant, Brown University, Providence RI
Department of Computer Science — *January 2009 – May 2009*

- Course: Topics in Computer Vision: The IKEA Object Recognition Challenge.

Research Assistant, Brown University, Providence RI
Department of Computer Science — *September 2006 – Present*

- Developed algorithms for estimating human shape and pose from multi-camera images using a richly detailed graphics model of 3D human shape. Formulated a clothing invariant functional to best predict the most likely naked shape under clothes. Shadow and shading information in strong lighting conditions were also considered to enable monocular estimation of human pose and shape.

Research Assistant, Brown University, Providence RI
Department of Computer Science — *September 2005 – May 2006*

- Considered the problem of video tracking using three-dimensional cylindrical human body models. Developed a new image likelihood function based on the visual appearance of the subject being tracked. Proposed a robust, adaptive, appearance model extended to the case of articulated body parts. Successfully enhanced the performance of a silhouette tracker by augmenting it with our adaptive appearance model.

Research Assistant, Brown University, Providence RI
Department of Computer Science — *January 2005 – May 2005*

- Investigated methods that could automatically discover features that discriminate between body parts and the background for articulated objects. Being able to reliably detect individual body parts should enhance tracking by permitting automatic initialization, avoiding error accumulation and improving the estimation of the likelihood.

Teaching Assistant, Brown University, Providence RI
Department of Computer Science — *September 2004 – December 2004*

- Course: Introduction to Computer Vision.

Research Assistant, Brown University, Providence RI
Department of Computer Science — *June 2004 – August 2004*

- Developed software to perform human motion estimation using annealed particle filtering.
- Set up the motion capture lab hardware to acquire ground truth data for human motion.

Research Assistant, Lafayette College, Easton PA
Department of Mathematics — *May 2001 – August 2002*

- Studied and written computer programs about the analysis of network reliability problems using symbolic logic. Proposed a new preprocessing system that outperforms the conventional preprocessing scheme.

Research Assistant, Lafayette College, Easton PA
Department of Mathematics — *May 2000 – August 2000*

- Investigated network reliability, together with clutters and their structure. Researched familiar properties or constructions associated with graph networks to arbitrary clutters, followed by an investigation of the extent to which the functioning of the properties or constructions was affected by the generalization.

Work Experience

Willow Garage, Menlo Park CA
Visiting consultant — *January 2009*
Person of Contact: Gary Bradski

- Worked on automating the process of creating a large database of 3D models of rotationally symmetric objects such as wine glasses using images taken with a telephoto lens to be used for object detection, recognition and tracking by a robotic vision system equipped with video and depth sensors.

Intel Corporation, Santa Clara CA
Internship – Advanced Multimedia Group — *June 2007 – August 2007*, *June 2006 – September 2006*
Supervisor: Horst Haussecker

- Worked on learning a deformable model of the human body from laser-scan data.

Intel Corporation, Santa Clara CA
Internship – Nanovision Group — *May 2005 – September 2005*
Supervisor: Horst Haussecker

- Worked on probabilistic techniques to accurately track the articulated motion of humans in video sequences. Developed likelihood models for modeling adaptive appearance of humans. Incorporated the developed algorithms into an existing probabilistic human tracking system.

Lafayette College, Easton PA
Computing Services and Support — *August 1999 – May 2001*

- Supervise lab employees and perform maintenance of PCs.

Lafayette College, Easton PA
Instructional Technology — *January 2000 – May 2000*

- Work with faculty to develop multimedia course materials, and introduce new technologies for teaching.

Publications

Journal Articles

- Leonid Sigal, Alexandru O. Balan and Michael J. Black. HumanEva: Synchronized Video and Motion Capture Dataset and Baseline Algorithm for Evaluation of Articulated Human Motion. To appear in *International Journal of Computer Vision*, 2009
- Alexandru O. Balan and Lorenzo Traldi. Preprocessing MinPaths for Sum of Disjoint Products. *IEEE Transactions on Reliability*, Vol. 52, No. 3, pp. 289-295, September 2003

Conference and Workshop Articles

- Peng Guan, Alexander Weiss, Alexandru O. Balan and Michael J. Black. Estimating Human Shape and Pose from a Single Image. *International Conference on Computer Vision*, September 2009
- Alexandru O. Balan and Michael J. Black. The Naked Truth: Estimating Body Shape Under Clothing. *European Conference on Computer Vision*, October 2008
- Leonid Sigal, Alexandru O. Balan and Michael J. Black. Combined Discriminative and Generative Articulated Pose and Non-rigid Shape Estimation. *Neural Information Processing Systems*, December 2007
- Alexandru O. Balan, Michael J. Black, Horst W. Haussecker and Leonid Sigal. Shining a Light on Human Pose: On Shadows, Shading and the Estimation of Pose and Shape. *International Conference on Computer Vision*, October 2007
- Alexandru O. Balan, Leonid Sigal, Michael J. Black, James E. Davis and Horst W. Haussecker. Detailed Human Shape and Pose from Images. *Computer Vision and Pattern Recognition*, June 2007
- Alexandru O. Balan and Michael J. Black. An Adaptive Appearance Model Approach for Model-based Articulated Object Tracking. *Computer Vision and Pattern Recognition*, pp. 758-765, June 2006
- Alexandru O. Balan, Leonid Sigal and Michael J. Black. A Quantitative Evaluation of Video-based 3D Person Tracking. *IEEE Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance*, pp. 349-356, October 2005

Undergraduate Thesis

- Alexandru O. Balan. An Enhanced Approach to Network Reliability Using Boolean Algebra. *Honors Thesis*, Lafayette College, Easton PA, May 2003

Conference Posters

- Alexandru O. Balan. Enhanced Approach Towards Network Reliability Using Boolean Algebra. *ESCCC Conference*, Bloomsburg University, Bloomsburg PA, October 2002

Unpublished Articles

- Alexandru O. Balan. Voxel Carving and Coloring – Constructing a 3D Model of an Object from 2D Images. Brown University, Providence RI, December 2003

Conference and Workshop Presentations

"The Naked Truth: Estimating Body Shape Under Clothing":

- European Conference on Computer Vision, Marseille France, October 2008

"Detailed Human Shape and Pose from Images":

- Conference on Computer Vision and Pattern Recognition, Minneapolis MN, June 2007

Invited Talks

"Recovering Detailed 3D Models of Human Shape and Pose from Images":

- Boston University CS Colloquium, Boston, MA November 2007
- MIT CSAIL Seminar, Cambridge MA, September 2007

"Towards Marker-less Articulated Human Tracking":

- Honda Research Institute, Mountain View CA, July 2006

"People Tracking using Adaptive Appearance Models":

- Intel Applications Research Lab (ARL), Santa Clara CA, September 2005

Other Talks

"Detailed Human Shape and Pose from Images":

- Brown University Computer Science Department Annual Retreat, Bristol RI, May 2007

Guest lectures in Computer Science Course 143 at Brown University (Introduction to Computer Vision), Fall 2005, Fall 2007, Fall 2008

Patents

- *"A method and apparatus for parametric body shape recovery under clothing and from multi-planar cast shadows with applications in retail clothing"*. Michael J. Black, Alexandru O. Balan and Oren Freifeld. Patent pending. Provisional filed August 15, 2008.
- *"Analysis of images with shadows to determine human pose and body shape"*. Michael J. Black, Alexandru O. Balan, Leonid Sigal and Horst W. Haussecker. Patent pending. Provisional filed August 15, 2008.

Professional Activities

- Member of UPE, PBK, PME, and ODE Honor Societies, ACM and IEEE
- Reviewed articles for PAMI (2009), IJCV (2008-2009), ICCV (2005, 2007), ECCV (2008), CVPR (2005-2009), NESCAI (2007), IEEE Workshop on Motion (2005)

Relevant Computer Science Skills

Programming Languages	Matlab, Java, C++
Operating Systems	Windows, Linux
Applications	Vicon Nexus & Workstation, Camera Calibration Toolbox