

BIOGRAPHICAL SKETCH

Dimitris Samaras

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Education:

Ph.D., Computer Science, University of Pennsylvania, 2001 . Advisor: **Dimitris Metaxas**
M.S., Computer Science, Northeastern University, Boston, MA, 1994
B.S., Computer Science and Engineering, University of Patras, Greece, 1992

Experience:

9/00 - Present Assistant Professor, Computer Science Department, SUNY at Stony Brook
9/95 - 9/00 Research assistant for prof. D. Metaxas, UPenn
9/92 - 6/94 Research assistant for profs. Gauch and York. Northeastern Univ
6/91 - 9/91 System software development for a high energy particle accelerator, CERN, Switzerland
9/90 - 3/92 Computer Center Operator. Univ. of Patras, Greece.
6/90 - 8/90 Programmer, National Electricity Company, Drama, Greece.

Teaching:

SUNY Stony Brook Fall 05 Graduate course in Robotics CSE378
SUNY Stony Brook Fall 05 Graduate course in Robotics CSE525
SUNY Stony Brook Fall 04 Graduate course in Advanced Image Processing CSE601/ESE559 (with Gene Gindi and Jerome Liang)
SUNY Stony Brook Fall 04 Graduate Topics in Computer Vision (with Theo Pavlidis) CSE592
SUNY Stony Brook Fall 03 Advanced graduate course in Machine Learning and Computer Vision, CSE615.
SUNY Stony Brook Fall 2001,02,03. Undergraduate course Introduction to Visual Computing CSE390.
SUNY Stony Brook Spring 2001,02,03,04,05. Graduate course in Computer Vision CSE527.
SUNY Stony Brook Fall, Spring 2001,02,03,04,05 Graduate Seminar in Computer Vision CSE 656 (formerly CSE666).
SUNY Stony Brook Fall 2000. Undergraduate course in Computer Vision CSE327.
UPenn 1996 – 1998. Graded graduate courses in Algorithms, Computer Architecture, Undergraduate courses in C.
UPenn 1995 – 1996. Teaching assistant for CSE110, Introduction to Programming, an introductory course in C.
Northeastern 1993 – 1994. Instructor for COM1105, Computer Science and Its Applications, an introductory computer applications course for non-CS majors.
Patras Summer 1992. Organized a two week summer course in Computer Systems for BEST, a European engineering student organization.

Summary of Research Accomplishments:

In current work in my group I am researching problems related with the interaction of illumination and 3D shape in images in Computer Vision (shape estimation, tracking, recognition) Computer Graphics (image relighting, augmented reality). Given our expertise in deformable model representations, focus application areas have been face and hand modeling. We have recently built a system for high resolution tracking and learning of 3d facial expression, that we currently use for the study of facial appearance and expression. We have proposed a face recognition method from a single image under arbitrary illumination, where a spherical harmonics basis is computed for each image from a statistical representation of spherical harmonics images. Combined with a morphable shape model, this approach has given excellent results in resynthesis of facial images under different pose and illumination. In the field of Medical Imaging we have demonstrated that Machine Learning methods can be useful in clinical diagnosis of drug addiction from fMRI brain images and are currently working on exploring temporal and interconnectivity information in fMRI

brain sequences.

Journal Publications:

1. Zhang, L., Samaras, D., Face Recognition from A Single Training Image under Arbitrary Unknown Lighting using Spherical Harmonics. In *IEEE Trans on Pattern Analysis and Machine Intelligence* (to appear)
2. Moreno-Noguer, F., Sanfeliu A., Samaras D., Integration of Deformable Contours and a Multiple Hypotheses Fisher Color Model for Robust Tracking in Varying Illuminant Environments. In *Image and Vision Computing* (to appear)
3. Duan, Y., Yang, L., Qin, H., Samaras, D., Zhao, H., PDE-Based Deformable Surface for Shape Reconstruction. In *Computer Vision and Image Understanding* (under review)
4. Wang, Y., Samaras, D., Estimation of Multiple Directional Illuminants from a Single Image . In *Image and Vision Computing* (under review)
5. Wang, Y., Huang, X., Lee, C.S., Zhang, S., Li, Z., Samaras, D., Metaxas, D., Elgammal, A., Huang, P. High Resolution Acquisition, Learning and Transfer of Dynamic 3-D Facial Expressions In *Computer Graphics Forum (EuroGraphics 2004)* pp. III: 677-686.
6. Wang Y., Samaras D., Estimation of Multiple Directional Light Sources for Synthesis of Augmented Reality Images. In *Graphical Models* 65, July 2003, pp. 185-205..
7. Samaras, D., Metaxas, D., Illumination Constraints in Deformable models for Shape and Light Direction Estimation. In *IEEE Transactions on Pattern Recognition and Machine Intelligence*, February 2003, pp. 247-264

Refereed Conference Publications:

1. Zhang, W., Samaras, D., Yang H., Zelinsky, G. A Computational Model of Eye Movements during Object Class Detection, in *Proceedings of Neural Information Processing (NIPS) 2005* (to appear)
2. Zelinsky ,G. Zhang, W., Yu, B., Chen, X., Samaras, D. The Role of Top-down and Bottom-up Processes in Guiding Eye Movements during Visual Search, in *Proceedings of Neural Information Processing (NIPS) 2005* (to appear)
3. Zhang, L., Samaras, D., Alia-Klein, N., Volkow, N., Goldstein, R., Modeling Neuronal Interactivity using Dynamic Bayesian Networks, in *Proceedings of Neural Information Processing (NIPS) 2005* (to appear)
4. Zhang, L., Samaras, D., Alia-Klein, N., Tomasi, D., Cottone, L., Leskovjan, A., Volkow, N., Goldstein, R., Exploiting Temporal Information in Functional Magnetic Resonance Imaging Brain Data, In *Proceesings of the International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2005*, Palm Springs, CA, pp. 679-687
5. Wang, Y., Gupta, M., Zhang, S., Wang, S., Gu, D., Samaras, D., Huang, P., High Resolution Tracking of Non-Rigid 3D Motion of Densely Sampled Data Using Harmonic Maps. In *Proceedings of the IEEE International Conference on Computer Vision 2005* Beijing, China, pp. 388-395
6. Moreno-Noguer, F., Sanfeliu, A., Samaras, D. Integration of Conditionally Dependent Object Features for Robust Figure/Background Segmentation. In *Proceedings of the IEEE International Conference on Computer Vision 2005* Beijing, China pp. 1713-1720
7. Wang S., Zhang L., Samaras D., Face Reconstruction across Different Poses and Arbitrary Illumination Conditions. In *Proceedings of Audio- and Video-based Biometric Person Authentication Conference 2005* Rye, NY, pp. 91-101.
8. Zhang, W., Bin, Y.,Zelinsky, G., Samaras, D. Object Class Recognition using Multiple Layer Boosting with Heterogeneous Features, to appear in *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2005* San Diego, CA, pp. II:323-330

9. Zhang L., Wang S., Samaras D., Face Synthesis and Recognition from a Single Image under Arbitrary Unknown Lighting using a Spherical Harmonic Basis Morphable Model. In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2005* San Diego, CA, pp. II:209-216
10. Zhang L., Samaras D., Goldstein R., Machine Learning for Clinical Diagnosis from Functional Magnetic Resonance Imaging. In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2005* San Diego, CA, pp. I:1211-1217
11. Zhang L., Wang Y., Wang S., Samaras D., Image-Driven Re-targeting and Relighting of Facial Expressions. In *Proceedings of the Computer Graphics International Conference 2005* Stony Brook, NY, pp. 11-18
12. Moreno-Noguer F., Sanfeliu A., Samaras D. Fusion of a Multiple Hypotheses Color Model and Deformable Contours for Figure Ground Segmentation in Dynamic Environments. In *Proc. 3rd IEEE Workshop on Articulated and Nonrigid Motion, ANM 2004*, (in conjunction with CVPR 2004), Washington, DC.
13. Huang X., Zhang S., Wang Y., A Hierarchical Framework for High Resolution Facial Expression Tracking. In *Proc. 3rd IEEE Workshop on Articulated and Nonrigid Motion, ANM 2004*, (in conjunction with CVPR 2004), Washington, DC.
14. Duan Y., Yang L., Qin H., Samaras D., Shape Reconstruction from 3D and 2D Data Using PDE-Based Deformable Surfaces. In *Proceedings of the European Conference of Computer Vision 2004* Prague, Czech Republic, pp. III:238-251 .
15. Zhang L., Samaras D. Pose Invariant Face Recognition under Arbitrary Unknown Lighting using Spherical Harmonics. In *LNCS Biometric Authentication Workshop* (in conjunction with ECCV2004), Prague, Czech Republic, pp. 10-23.
16. Wang Y., Samaras D. Multiple Directional Illuminant Estimation from a Single Image. In *Proceedings of the IEEE Workshop on Color and Photometric Methods in Computer Vision* (in conjunction with ICCV 2003) Nice, France.
17. Face Recognition Under Variable Lighting using Harmonic Image Exemplars. Lei Zhang, Dimitris Samaras. In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2003*, Madison, WI, pp. I:19-25.
18. Using Multiple Cues for Hand Tracking and Model Refinement Shan Lu, Dimitris Metaxas, Dimitris Samaras, John Oliensis. In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2003* Madison, WI, pp. II:443-450
19. Model-based Integration of Visual Cues for Hand Tracking. Shan Lu, Gang Huang , Dimitris Samaras, Dimitris Metaxas. In *Proceedings of the IEEE Workshop in Motion and Video Computing 2002*, Orlando, FL, pp. 118-124
20. Estimation of Multiple Directional Light Sources for Synthesis of Mixed Reality Images. Yang Wang, Dimitris Samaras In *Proceedings of Pacific Graphics 2002*, Beijing, China, pp. 38-47.
21. Wang Y., Samaras D., Estimation of Multiple Illuminants from a Single Image of Arbitrary Known Geometry. In *Proceedings of the European Conference of Computer Vision 2002* Copenhagen, Denmark, pp III:272-288.
22. Samaras D., Metaxas D., Fua P. and Leclerc Y.G. Variable Albedo Surface Reconstruction from Stereo and Shape from Shading. In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 2000* Hilton Head, SC, pp. I:480-487.
23. Samaras, D., Metaxas, D., Coupled Lighting Direction and Shape Estimation from Single Images, In *Proceedings of the IEEE International Conference on Computer Vision 1999* Corfu, Greece, pp. 868-874.
24. Samaras, D., Metaxas, D., Incorporating Illumination Constraints in Deformable Models, In *Proceedings of the IEEE Computer Vision and Pattern Recognition Conference 1998* Santa Barbara, CA, pp. 322-329.

Funding

- NIH-NIDA PI: Machine Learning Techniques to Analyze Dynamic Functional Neuro-Imaging of the Mechanisms Underlying Inhibitory Control 09/05-08/10 \$1,166,605
- NSF-HSD co-PI: See Where I'm Looking: Using Shared Eyegaze to Coordinate Time-Critical Collaborative Tasks (PI: G. Zelinsky) 10/05-9/08 total budget \$742,000
- NSF-ITR co-PI: Stochastic Multicue Tracking of Objects with Many Degrees of Freedom (PI: D. Metaxas, Rutgers), 9/03-8/06, \$170,000 of total budget \$400,000
- DoJ. Subcontract from Notre Dame for research in Biometrics. 10/03-9/06 \$125,000
- BNL subcontract: Functional Neuroimaging in drug addiction and other problem behaviors. (PI: Rita Goldstein, BNL). 9/03-8/05, \$47,000.
- DoE co-PI: Imaging the Awake Animal Brain (PI: T. Ernst, Brookhaven National Lab), 6/01-9/05, \$230,000 of total budget \$4,500,000

Memberships

IEEE, ACM.

University Service

CS Coordinator for High School Student Research Experience Program
Advisor to CEAS Undergrad Robotics Team CS Graduate Admissions committee member
CS Undergraduate Recruitment Committee
CS Faculty Recruitment Committee
Design of departmental Midterm course evaluation form
Member of Committee for Redesign of the CS PhD Qualifying System

Community Service

High School Senior Science Projects:
Dan Lopuch
Shira Mitchell (Simmons Fellow, Lucent Fellow)
AndreW Hsiao (Simmons Fellow)

Professional Activities

Courses Chair *IEEE International Conference in Computer Vision ICCV 2007*.
Program Chair *Computer Graphics International 2005*
Org. Committee Member *International Workshop on Volume Graphics, 2001*.
Program Committee Member *Pacific Graphics 2005, IEEE Workshop on Variational, Geometric and Level Set Methods in Computer Vision 2005, 3D Data Processing, Visualization, and Transmission 2004, IEEE Articulated Nonrigid Motion 2004, CASA 2003, IEEE WMVC 2002, Volume Graphics 2001, Web3D Symposium 2001*.
Reviewer, *Computer Vision and Pattern Recognition Conference 1998, 2000*.
Reviewer, *IEEE Trans. Pattern Analysis and Machine Intelligence*.
Reviewer, *International Journal of Computer Vision*
Reviewer, *IEEE Trans. Medical Imaging*.
Reviewer, *IEEE Systems, Man and Cybernetics - Part B*.
Reviewer, *Computer Vision and Image Understanding*.
Reviewer, *Graphical Models and Image Processing*.
Reviewer, *Visual Computer*.

Founding member and secretary of the local branch of BEST, a European engineering student organization in the Univ. of Patras, Greece. 1990 – 1993.

Graduate Students

Current PhD students:

Yang Wang (exp. grad. 05/2006)

Lei Zhang (exp. grad. 05/2006)

Wei Zhang (exp. grad. 05/2007)

Bing Yu (exp. grad. 2008)

Sen Wang (exp. grad. 2008)

Andrei Todor, (exp. grad. 2010)

Lei Zhang (exp. grad. 2010)

Alexandros Panagopoulos (exp. grad. 2010)

Graduated MS students: Mohit Gupta, Liu Yang, Kefei Lu, Jian Zhong, Zhongbin Zhu

Current MS students: Hyung-Yeon Gu, Tom Swedlund