

CURRICULUM VITAE (CUNY official format)

DATE OF PREPARATION 1/18/2015

1. NAME Michael David Grossberg

Affiliations: (e.g. City College, Graduate Center, non-CCNY or CUNY affiliations, etc.)
City College, City University

2. HIGHER EDUCATION PhD

(indicate your Masters/PhD/Postdoctoral Mentor)

A. Degrees

<u>Institution</u>	<u>Degrees & Major</u>	<u>Date Conferred</u>
Massachusetts Institute of Technology	PhD, Mathematics	6/1991
University of Pennsylvania	BA, Mathematics	6/1986

Thesis Advisor, Raoul Bott (Harvard), Victor Guillemin (MIT)

3. EXPERIENCE

(list in reverse chronological order)

<u>Position/Title/Rank</u>	<u>Dates</u>	<u>Institution / Department</u>
Assistant Professor(w/Tenure)	2008-Present	City College of N.Y./Computer Science
Assistant Professor	2004-2008	City College of N.Y./Computer Science
Research Scientist	1999-2004	Columbia University/Computer Science
Lecturer	1997-1999	Columbia University/Computer Science
Visiting Scholar	1995-1996	Max Planck Institute for Mathematics, Bonn
Ritt Assistant Professor	1993-1997	Columbia University/Mathematics
Postdoctoral Fellowship	1991-1993	Hebrew University/Mathematics

Note: Max Planck Institute is Germany's equivalent to the Princeton Institute for Advanced Studies and Hebrew U. is Israel's highest ranked University for Mathematics. Hebrew U. has had 8 Nobel laureates and currently has a Field's Medalist (Nobel equivalent for Mathematics).

4. RESEARCH, SCHOLARSHIP, AND CREATIVE WORK

(list in reverse chronological order, and if more than two authors/creators please indicate your contribution as Major, Equal, or Minor)

Google Scholar: h-index 24, i10-index 32, Total Citations 3035

A. Peer and Critically Reviewed Work (citations from Google scholar)

(1) Books and book chapters

Nayar, S., G. Krishnan, M. Grossberg, and R. Raskar. 2011. "Visual Chatter in the Real World." In *Robotics Research*, 13–24. Springer Berlin Heidelberg, Minor, Citations: 3

Hu, Y, M Grossberg, and G Mageras. 2009. "Survey of Recent Volumetric Medical Image Segmentation Techniques." In *Biomedical Engineering*, edited by Carlos Alexandre Barros de Mello, 321–46. Rijeka, Croatia: InTech., Equal, Citations: 21

Rahul Swaminathan, Michael D. Grossberg, and Shree K. Nayar, Beyond Perspective Imaging - Geometry and Design Proc. of Workshop on "Imaging Beyond the Pinhole Camera", Schlo Dagstuhl. Wadern, Germany June 2004, Minor, Citations: 0

(2) Journal articles

Tessler, Z., C. Vörösmarty, M. Grossberg, I. Gladkova, H. Aizenman, J. Syvitski, and E. Foufoula-Georgiou. 2015. "Profiling Risk and Sustainability in Coastal Deltas of the World." *Science* 349 (6248). American Association for the Advancement of Science: 638–43., Equal, Citations: 7,

Krakauer, N., M. Grossberg, I. Gladkova, and H. Aizenman. 2013. "Information Content of Seasonal Forecasts in a Changing Climate." *Advances in Meteorology* 2013. Hindawi Publishing Corporation: 12., Equal, Citations: 3

Gladkova, I., M. Grossberg, G. Bonev, P. Romanov, G. Riggs, and D. Hall. 2013. "A Full Snow Season in Yellowstone: A Database of Restored Aqua Band 6." *Geoscience and Remote Sensing Letters, IEEE* 10 (3). IEEE: 553–57., Equal, Citations: 1

Cross, J., I. Gladkova, W Paul Menzel, A. Heidinger, and M. D. Grossberg. 2013. "Statistical Estimation of a 13.3 M Visible Infrared Imaging Radiometer Suite Channel Using Multisensor Data Fusion." *Journal of Applied Remote Sensing* 7 (1). International Society for Optics; Photonics: 073473–3., Minor, Citations: 0

Gladkova, I., F. Shahriar, M. Grossberg, R. Frey, and W. P. Menzel. 2013. "Impact of the Aqua MODIS Band 6 Restoration on Cloud/Snow Discrimination." *Journal of Atmospheric and Oceanic Technology* 30 (12): 2712–9., Equal, Citations: 0

Gladkova, I., M. Grossberg, F. Shahriar, G. Bonev, and P. Romanov. 2012. "Quantitative Restoration for MODIS Band 6 on Aqua." *Geoscience and Remote Sensing, IEEE Transactions on* 50 (6). IEEE: 2409–16., Equal, Citations: 18

Gladkova, I., M. Grossberg, G. Bonev, P. Romanov, and F. Shahriar. 2012. "Increasing the Accuracy of MODIS/Aqua Snow Product Using Quantitative Image Restoration Technique." *Geoscience and Remote Sensing Letters, IEEE* 9 (4). IEEE: 740–43., Equal, Citations: 3

Hu, Y., M. Grossberg, A. Wu, N. Riaz, C. Perez, and G. Mageras. 2012. "Interactive Semiautomatic Contour Delineation Using Statistical Conditional Random Fields

Framework." *Medical Physics* 39 (7). American Association of Physicists in Medicine: 4547–58., Major, Citations: 8

Swaminathan, R., M.D. Grossberg, and S.K. Nayar. 2006. "Non-Single Viewpoint Catadioptric Cameras: Geometry and Analysis." *International Journal of Computer Vision* 66 (3): 211–29., Major, Citations: 106

Nayar, S., G. Krishnan, M. Grossberg, and R. Raskar. 2006. "Fast Separation of Direct and Global Components of a Scene Using High Frequency Illumination." *ACM Trans. on Graphics (SIGGRAPH)*, July, 935–44., Equal, Citations: 286

Grossberg, M., and S. Nayar. 2005. "The Raxel Imaging Model and Ray-Based Calibration." *International Journal of Computer Vision* 61 (2). Kluwer Academic Publishers: 119–37. Major, Citations: 294

Hadjidemetriou, E., M. Grossberg, and S. Nayar. 2004. "Multiresolution Histograms and Their Use for Recognition." *IEEE Transactions on Pattern Analysis and Machine Intelligence* 26 (7): 831–47., Major, Citations: 235

Grossberg, M., and S. Nayar. 2004. "Modeling the Space of Camera Response Functions Images." *IEEE Transactions on Pattern Analysis and Machine Intelligence* 26 (10): 1272–82., Major, Citations: 177

Grossberg, M., and S. Nayar. 2003. "Determining the Camera Response from Images: What Is Knowable?" *IEEE Transactions on Pattern Analysis and Machine Intelligence* 11 (November): 1455–67., Major, Citations: 203

Hadjidemetriou, E., Grossberg M.D., and S.K. Nayar. 2001. "Histogram Preserving Image Transformations." *International Journal of Computer Vision* 45 (1): 5–23., Major, Citations: 27

Grossberg, M., and Y. Karshon. 1998. "Equivariant Index and the Moment Map for Completely Integrable Torus Actions." *Advances in Mathematics* 133 (2): 185–223., Major, Citations: 26

Grossberg, M., and Y. Karshon. 1994. "Bott Towers, Complete Integrability, and the Extended Character of Representations." *Duke Math Journal* 76 (1): 23–58., Major, Citations: 79

3) Refereed conference proceedings

Hu, Y, M Grossberg, and G Mageras. 2015. "SU-d-BRA-03: What Image Features Are Useful for Tumor Segmentation in Multi-Modal Images?" *Medical Physics* 42 (6). American Association of Physicists in Medicine: 3213–3., Major, Citations: 0

Aizenman, H., M. Grossberg, I. Gladkova, and N. Krakauer. 2015. "Toolbox for Evaluating Ensembles Using an Information Gain Measure." AMS Annual Meeting, Phoenix., Equal, Citations: 0

Hu, Y, M Grossberg, and G Mageras. 2014. "Tumor Segmentation with Multi-Modality Image in Conditional Random Field Framework with Logistic Regression Models." In *Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE*, 6450–4. IEEE., Major, Citations: 0

Gladkova, I., J. Cross, P. Menzel, A. Heidinger, and M. Grossberg. 2013. "Statistical Estimation of a 13.3 Micron Channel for VIIRS Using Multisensor Data Fusion with Application to Cloud-Top Pressure Estimation." *Proc. AMS 29th Conference on Environmental Information Processing Technologies, Austin, TX*., Minor, Citations: 1

Tessler, Z., C. Vörösmarty, K. McDonald, R. Schroeder, M. Grossberg, I. Gladkova, and H. Aizenman. 2013. "A Global Deltas Typology of Environmental Stress and Its Relation to Terrestrial Hydrology." *AGU Fall Meeting Abstracts 1: 02*., Equal, Citations: 0

Aizenman, H., M. Grossberg, D. Jones, N. Barnes, J. Smerdon, K. Anchukaitis, and Julien E. Geay. 2012. "Web Based Visualization Tool for Climate Data Using Python." *92nd AMS Annual Meeting, Second Symposium on Advances in Modeling and Analysis Using Python*., Equal, Citations: 1

Grossberg, M., J. Gabaldon, P. Alabi, J. Neiman, and I. Gladkova. 2011. "Graphyte Software for Integrated Remote Sensing Research Using HPCC." In *SPIE Optical Engineering+ Applications*, 81531F–81531F. International Society for Optics; Photonics., Major, Citations: 0

Gladkova, I., M. Grossberg, G. Bonev, and F. Shahriar. 2011. "A Multiband Statistical Restoration of the Aqua MODIS 1.6 Micron Band." In *SPIE Defense, Security, and Sensing*, 804819–9. International Society for Optics; Photonics., Equal, Citations: 4

Gladkova, I., F. Shahriar, M. Grossberg, G. Bonev, D. Hillger, and S. Miller. 2011. "Virtual Green Band for GOES-R." In *SPIE Optical Engineering+ Applications*, 81531C–81531C. International Society for Optics; Photonics., Equal, Citations: 0

Grossberg, M., F. Shahriar, I. Gladkova, P. Alabi, D. Hillger, and S. Miller. 2011. "Estimating True Color Imagery for GOES-R." In *SPIE Defense, Security, and Sensing*, 80481A–80481A. International Society for Optics; Photonics., Major, Citations: 1

Hu, Y, M Grossberg, and G Mageras. 2011. "TH-a-220-07: Semi-Automatic Multi-Modality Image Segmentation for Normal Organ Delineation in Head & Neck Radiation Treatment Planning." *Medical Physics* 38 (6). American Association of Physicists in Medicine: 3847–7., Equal, Citations: 0

Ahmed, S, R Amin, I Gladkova, A Gilerson, M Grossberg, S Hlaing, F Shariar, and P Alabi. 2010. "Characterizing Bio-Optical and Ecological Features of Algal Bloom Waters for Detection and Tracking from Space." In *SPIE Defense, Security, and Sensing*, 767804–4. International Society for Optics; Photonics., Equal, Citations: 0

Bonev, G, I Gladkova, and M. Grossberg. 2010. "Increasing the Accuracy of MODIS Snow Product Using Quantitative Restoration for MODIS Band 6 on Aqua." *AGU Fall Meeting Abstracts* 1: 1343., Equal, Citations: 2

Gladkova, I., M. Grossberg, and F. Shahriar. 2010. "Quantitative Image Restoration." In *SPIE Defense, Security, and Sensing*, 769519–9. International Society for Optics; Photonics., Equal, Citations: 7

Hu, Y, M Grossberg, and G Mageras. 2010. "Fast Graph-Based Medical Image Segmentation with Expert Guided Statistical Information." In *Information Technology and Applications in Biomedicine (ITAB), 2010 10th IEEE International Conference on*, 1–5. IEEE., Major, Citations: 0

Gladkova, I., M. Grossberg, S. Gottipati, F. Shahriar, and G. Bonev. 2009. "Error Mitigation for CCSD Compressed Imager Data." In *SPIE Optical Engineering+ Applications*, 744408–8. International Society for Optics; Photonics., Equal, Citations: 0

Grossberg, M., I. Gladkova, I. Guch, P. Alabi, F. Shahriar, G. Bonev, and H. Aizenman. 2009. "Rich Client Data Exploration and Research Prototyping for NOAA." In *SPIE Optical Engineering+ Applications*, 74560C–74560C. International Society for Optics; Photonics., Major, Citations: 1

Grossberg, M., S. Gottipati, I. Gladkova, M. Rabinowitz, P. Alabi, T. George, and A. Pacheco. 2009. "A Comparative Study of Lossless Compression Algorithms on Multispectral Imager Data." In *SPIE Defense, Security, and Sensing*, 733408–8. International Society for Optics; Photonics., Equal, Citations: 2

Said, E., A. Homaifar, and M. Grossberg. 2009. "Creating Virtual Sensors Using Learning Based Super Resolution and Data Fusion." In *Aerospace Conference, 2009 IEEE*, 1–9. IEEE., Equal, Citations: 5

Hu, Y., M. Grossberg, and G. Mageras. 2008. "Semi-Automatic Medical Image Segmentation with Adaptive Local Statistics in Conditional Random Fields Framework." In *Engineering in Medicine and Biology Society, 2008. EMBS 2008. 30th Annual International Conference of the IEEE*, 3099–3102. IEEE., Major, Citations: 10

Yu, G., M. Grossberg, G. Wolberg, and I. Stamos. 2008. "Think Globally, Cluster Locally: A Unified Framework for Range Segmentation." *Proceedings of the 4th International Symposium on 3D Data Processing, Visualization and Transmission (3DPVT'08), Atlanta, USA.*, Major, Citations: 11

Gladkova, I, S Gottipati, and M Grossberg. 2007. "A New Lossless Compression Algorithm for Satellite Earth Science Multi-Spectral Imagers", *Proceedings of the SPIE*, 6683. International Society for Optical Engineering; 1999: 6683., Equal, Citations: 4

Gottipati, S., J. Goddard, M. Grossberg, and I. Gladkova. 2007. "A Comparative Study of Lossless Compression Algorithms on MODIS Data." In *Optical Engineering+ Applications*, 66830F–66830F. International Society for Optics; Photonics., Major, Citations: 4

Grossberg, M, S Gottipati, and I Gladkova. 2007. "The Impact of Striping Artifacts on Compression." In *Proceedings of the SPIE*, 6683–22. International Society for Optical Engineering; 1999., Major, Citations: 3

Park, Jong-Il, Moon-Hyun Lee, Michael Grossberg, and Shree K Nayar. 2007. "Multispectral Imaging Using Multiplexed Illumination." In *Computer Vision, 2007. ICCV 2007. IEEE 11th International Conference on*, 1–8. IEEE., Equal, Citations: 129

Gladkova, I, and M Grossberg. 2006. "A Lossless Compression Algorithm for Hyperspectral Data." *Proceedings of the SPIE, Satellite Data Compression, Communications, and Archiving II* 6300: 630001., Equal, Citations: 3

Gladkova, I, M Grossberg, E Grayver, D Olsen, N Nalli, W Wolf, L Zhou, and M Goldberg. 2006. "Priority-Based Error Correction Using Turbo Codes for Compressed AIRS Data." In *SPIE Optics+ Photonics*, 630008–8. International Society for Optics; Photonics.

Grossberg, M, S Gottipati, I Gladkova, M Goldberg, and L Roytman. 2006. "An Analysis of Optimal Compression for the Advanced Baseline Imager Based on Entropy and Noise Estimation." In *SPIE Optics+ Photonics*, 63000M–63000M. International Society for Optics; Photonics., Equal, Citations: 3

Fujii, Kensaku, Michael D Grossberg, and Shree K Nayar. 2005. "A Projector-Camera System with Real-Time Photometric Adaptation for Dynamic Environments." In *Computer Vision and Pattern Recognition, 2005. CVPR 2005. IEEE Computer Society Conference on*, 1:814–21. IEEE., Major, Citations: 135

Grossberg, M., H. Peri, S. Nayar, and P. Belhumeur. 2004. "Making One Object Look Like Another: Controlling Appearance Using a Projector-Camera System." In *Computer Vision and Pattern Recognition, 2004. CVPR 2004. Proceedings of the 2004 IEEE Computer Society Conference on*, 1:452–59. IEEE., Major, Citations: 156

Swaminathan, R., M. Grossberg, and S.K. Nayar. 2004. "Designing Mirrors for Catadioptric Systems That Minimize Image Errors." *Fifth Workshop on Omnidirectional Vision*, May., Major, Citations: 39

Grossberg, M. and S. Nayar. 2003. "What Is the Space of Camera Response Functions?" In *Computer Vision and Pattern Recognition, 2003. Proceedings. 2003 IEEE Computer Society Conference on*, 2:II–602. IEEE. , Citations: 117

Hadjidemetriou, E., M. Grossberg, and S. Nayar. 2003. "Multiresolution Histograms and Their Use for Texture Classification." *3rd International Workshop on Texture Analysis and Synthesis at ICCV*, Equal, Citations: 12

Nayar, S., H. Peri, M. Grossberg, and P. Belhumeur. 2003. "A Projection System with Radiometric Compensation for Screen Imperfections." *ICCV Workshop on Projector-Camera Systems (PROCAMS)*, October., Equal, Citations: 174

Swaminathan, R, M. Grossberg, and S. Nayar. 2003. "A Perspective on Distortions." In *Computer Vision and Pattern Recognition, 2003. Proceedings. 2003 IEEE Computer Society Conference on*, 2:594–601. IEEE., Major, Citations: 82

Grossberg, M., and S. Nayar. 2002. "What Can Be Known About the Radiometric Response from Images?" In *Computer Vision—ECCV 2002*, 189–205. Springer Berlin Heidelberg., Major, Citations: 86

Hadjidemetriou, E., M. Grossberg, and S. Nayar. 2002. "Resolution Selection Using Generalized Entropies of Multiresolution Histograms." In *Computer Vision—ECCV 2002*, 220–35. Springer Berlin Heidelberg, Equal, Citations: 6

Grossberg, M., and S. Nayar. 2001. "A General Imaging Model and a Method for Finding Its Parameters." In *Computer Vision, 2001. ICCV 2001. Proceedings. Eighth IEEE International Conference on*, 2:108–15. IEEE., Major, Citations: 229

Hadjidemetriou, E., M. Grossberg, and S. Nayar. 2001. "Spatial Information in Multiresolution Histograms." In *Computer Vision and Pattern Recognition, 2001. CVPR 2001. Proceedings of the 2001 IEEE Computer Society Conference on*, 1:702–9. IEEE., Major, Citations: 57

Swaminathan, R., M. Grossberg, and S. Nayar. 2001. "Caustics of Catadioptric Cameras." In *Computer Vision, 2001. ICCV 2001. Proceedings. Eighth IEEE International Conference on*, 2:2–9. IEEE., Major, Citations: 131

Hadjidemetriou, E., M. Grossberg, and S. Nayar. 2000. "Histogram Preserving Image Transformations." In *Computer Vision and Pattern Recognition, 2000. Proceedings. IEEE Conference on*, 1:410–16. doi:[10.1109/CVPR.2000.855848](https://doi.org/10.1109/CVPR.2000.855848)., Major, Citations: 0

(4) Critically reviewed work (e.g. exhibitions, performances, art work, works of architecture, landscape architecture, and urban design, curricular, audiovisual, or online materials, etc.) with description of works and venue, and reference to published critical review(s).

B) Other Scholarly Work (not peer/critically reviewed)

(1) Invited presentation

Shree Nayar, Gurunandan G. Krishnan and Michael Grossberg "Visual Chatter in the Real" World, 13th International Symposium of Robotic Research (ISRR2007), Minor (presenter Nayar)

(2) Other articles and contributed presentations

M. Grossberg, "Exploring approaches to using new technology with SOS data for project based K-12 teaching", Workshop Talk, NOAA Science on a Sphere User Collaborative Network Workshop, Portland OR, December 2015

Y. Ding, A. Ignatov, M. Grossberg, I. Gladkova, C. Chu, Regional validation and potential enhancements to NOAA polar ACSPO SST products, Oral, NOAA Cooperative Research Program (CoRP), 11th Annual Science Symposium, September, 2015

G. Bonev, F. Shahriar, I. Gladkova, M. Grossberg, Supervised machine learning for MODIS snow cover detection, Poster, 2014

I. Gladkova, F. Shahriar, Y. Kihai, B. Petrenko, A. Ignatov, M. Grossberg, M. Bouali, Pattern Recognition Enhancements to NOAA ACSPO Clear-Sky Mask, GHRSSST XIV Science Team Meeting, Woods Hole, MA, USA, 17-21 June 2013

I. Gladkova, J. Cross, A. Heidinger, P. Menzel, M. Grossberg, Cloud-Top Pressure Estimation from VIIRS using Statistically-Reconstructed 13.3-micron Channel, Satellite Conference for Direct Readout, GOES/POES, and GOES-R/JPS Users, College Park, MD, April 2013

Irina Gladkova, M. Grossberg, Poster, Progress on reducing risk of data loss for ABI using Quantitative Image Restoration, NOAA, GOES-R Science Week, 2012

I. Gladkova, M. Grossberg, G. Bonev, P. Romanov, Seasonal snow cover of Yellowstone estimated with restored MODIS Aqua, and MODIS Terra snow cover maps, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle in Kona, Hawaii, Feb. 2012

M. Grossberg, H. Aizenman, B. Fekete, I. Gladkova, C. Vörösmarty, Poster, Multivariate structural signatures of precipitation and water discharge, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle in Kona, Hawaii, Feb. 2012

I. Gladkova, M. Grossberg, G. Bonev, F. Shahriar, A Multi-band statistical restoration of the Aqua 1.6 micron channel for the A-Train, Poster, International Symposium on the A-Train Satellite Constellation, 2010

Gladkova, I., M. Grossberg, G Bonev, and F Shahriar. "Increasing the Accuracy of MODIS Snow Product MOD10 L2/MYD10 L2 Using Quantitative Restoration for MODIS Band 6 on Aqua.", Technical Report, 2010

(3) Other scholarly and creative work (e.g. exhibitions, performances, art work, works of architecture, landscape architecture, and urban design, curricular, audiovisual, or online materials, etc.) with description of works and venue as applicable.

- Developed the prototype for NOAA's ACSPO Regional Monitor of Sea Surface Temperature (SST) in HTML and JavaScript:

<http://www.star.nesdis.noaa.gov/sod/osb/sst/yding/specialregionsfoundation>

5. GRANTS, FELLOWSHIPS, AND AWARDS
(list in reverse chronological order)

Guidelines: Include the principal investigator/awardee, date/period of award, total amount (if applicable), and candidate's share (if applicable).

(1) Grants and Contracts

Co-PI on Combining JPSS with Geostationary Imager data for Fused Earth Observation Parameters: Improving JPSS data with fusion tool, NOAA JPSS Proving Grounds, 09/2012-08/2013, \$60K

Co-PI on "Application of information theory to measure and increase the skill of long-term forecasting," NOAA Climate Office Program, 08/2012 - 06/2014, \$113K

Co-PI on "Quantitative Image Restoration for GOES-R risk reduction, NOAA GOES-R Risk Reduction, 09/2011 – 08/2013, \$110K

Co-PI (one of eight) on "Global-scale assessment of threatened river delta systems: Evaluation of connections between the continental land mass and ocean through integrated remote sensing and process modeling," NASA Land Cover/Land Use Change, 01/2012 - 01/2015, \$1,495,661

Co-PI (one of twelve CUNY-PIs) on Cooperative Remote Sensing Science and Technology Center funded by NOAA 2011-2016, \$10 million

Co-PI on "Graphyte Toolkit as Online Lab for NOAA Distance Learning," NOAA/NESDIS, 09/2010 – 08/2012, \$40,000

Co-PI on "Using Graphyte to create a Platform for NOAA Collaborative Scientific Computing," 09/2010 – 08/2012, \$80,000

PI on "Algorithm for Quantitative Image Restoration and Graphyte Algorithm Development Tool," NOAA/NESDIS, 09/2009 - 09/2010, \$80,000

Co-PI for a 2-year contract "A NOAA Exploratorium: Teaming Game Technology with NOAA HPC resources for Collaborative Data Exploration and Research Prototyping" (NOAA High Performance Computing and Communications (HPCC) Program) \$120,000

PI on Contract from NOAA-NESDIS for compression research in 2008, \$230,000

PI on Contract from NOAA-NESDIS for compression research in 2007, \$240,000

PI for Semi-automatic and Automatic Segmentation of Anatomical Structures from CT images for Radiation Treatment Planning, was selected for a one year 2007-2008, \$40,000 award through the CCNY/MSKCC Biomedical Engineering Partnership (P20)

Co-PI (one of nine CUNY-PIs) on Cooperative Remote Sensing Science and Technology Center funded by NOAA 2006-2011, \$12.5 million

Senior Researcher to the successful Center for Perceptual Robotics, Intelligent Sensors and Machines (PRISM) at the City College of New York proposal.

Co-PI (one of six CCNY PIs) on the successful \$2.8 million proposal awarded to CUNY to be part of NOAA Interdisciplinary Scientific Environmental Technology (ISET) from 2006-2011

PI, on a \$12,000 grant in 2005, for “Appearance of Wet Roads at Night”, Siemens Corp.

PI on a \$3,000 PSC-CUNY Award “Learning What to See: How Best to Extend Machine Vision”

6. PROFESSIONAL ACTIVITIES

(list in reverse chronological order, including dates/periods)

(1) Inventions and patents (including patent numbers)

Park, J., M. Lee, M. Grossberg, and S. Nayar. 2012. “Method of Multispectral Imaging and an Apparatus Thereof.”, US Patent 8,284,279, Equal, Citations: 0

Gladkova, I., M. Grossberg, and L. Roytman. 2011. “Selectively Lossy, Lossless, and/or Error Robust Data Compression Method.”, US Patent 7,907,78, Equal, Citations: 8

Nayar, S., M. Grossberg, H. Peri, and P. Belhumeur. 2010. “Methods and Systems for Compensating an Image Projected onto a Surface Having Spatially Varying Photometric Properties.”, US Patent 7,663,640, Equal, Citations: 9

Nayar, S., K. Gurunandan, M. Grossberg, and R. Raskar “Method for Separating Direct and Global Illumination in a Scene”, US Patent App. 11/624016, Equal, Citations: 5

Grossberg, M., S. Nayar, 2006 “Method and system for enhancing data quality”, US Patent 7,151,801, Major, Citations: 7

Swaminathan, R., M. Grossberg, and S. Nayar. 2000. “Method and Apparatus for Reducing Distortion in Images.” *US Patent 7.245.761.*, Equal, Citations: 8

Yemini, Y., M. Grossberg, and D. Florissi. 2001. "Method and Apparatus for Providing Forwarding and Replication Services on a Dynamically Addressed Network." *US Patent App. 09/775,349*, Major, Citations: 17

Yemini, Y., M. Grossberg, and D. Florissi. 2001 "Method and Apparatus for Dynamically Addressing a Circuits Based Network." *US Patent App. 09/775,348* Major, Citations: 14

Yemini, Y., M. Grossberg, and D. Florissi. 2001. "Method and Apparatus for the Exchange of Data Between a Dynamically Addressed Network and a Foreign Network." *US Patent App. 09/775,346*, Major, Citations: 25

Yemini, Y., M. Grossberg, and D. Florissi. 2001. "A Method and Apparatus for Dynamically Addressing and Routing in a Data Network." *US Patent App. 09/775,349*, Major, Citations: 26

Yemini, Y., M. Grossberg, and D. Florissi. 2001. "Method and apparatus for providing services on a dynamically addressed network." *US Patent App. 09/775,347*, Major, Citations: 92

(2) Review panels

- Reviewer for IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- Reviewer for IEEE International Conference on Computer Vision (ICCV)
- Reviewer for ACM International Conference on Computer Graphics and Interactive Techniques (SIGGRAPH)
- Reviewer for International Journal of Computer Vision (IJCV)

(2) Consulting: Pro-bono advising to internet startups

(3) Membership in Professional Societies:

- Member IEEE
- Member ACM

(4) Other impact:

- Providing algorithm developed with I. Gladkova and alpha-implementation for Snow Identification to US Navy-NOAA National Ice Center for use by Ice Analysts
- 13.3 micron fusion algorithm for VIIRS developed with I. Gladkova is being tested for inclusion into NOAA's operational cloud-top pressure
- Implementation and Algorithms developed with I. Gladkova are now part of NASA's official Snow Product for MODIS/Aqua in Collection 6
- Implementations of the algorithms Prof. Grossberg has developing with his collaborators at City College have been delivered to NOAA to be used to

compress remotely sensed satellite data from Hyperspectral Imagers and Sounders.

- The medical segmentation software Prof. Grossberg is developing in collaboration with researchers at Memorial Sloan Kettering is being developed for clinical use to aid the planning of the radiological treatment of cancer patients.
- Adobe has licensed the DoRF and EmoR models that Prof. Grossberg with Shree Nayar Adobe developed for use in the Photoshop family of products.

7. INSTRUCTIONAL ACTIVITIES

(material may be submitted as a portfolio in appendix II)

(See Appendix)

- (1) Innovative instructional activities, including curriculum and program development
 - Developed a Masters Course, Topics in Advanced Internet Programming which combines a student lead seminar on the latest in web technologies with project based component where student groups build web services and applications.
 - Developed a prototype system integrating with blackboard for automated grading of programming assignments used in both advanced and intro courses.
 - Designed 2 CS Units for Engineering 101, help maintain course unit
- (2) Development of online/hybrid or service learning courses
 - Completed Center for Excellence in Technology and Learning (CETL) training course on hybrid learning. Incorporated several techniques from the course into instruction.
 - Organized a Software Carpentry workshop, which trained environmental scientists and engineers in basic software development.

8. ADVISING & MENTORING ACTIVITIES

(1) Academic advising

Formal advisor for Computer Engineering from 2004-present. Per semester review of students' academic and professional goals, and courses.

(2) Student project/research mentoring activities together with descriptions of mentored projects and list of mentees (as appropriate), and awards/grants won by mentees.

On-going Ph.D. Students

- Ph.D. Student, Yu-Chi (Jason) Hu, Full time developer in the Medical Physics Radiation Treatment Planning Department at Memorial Sloan Kettering Cancer Center, Proposed Thesis, Should Finish 2016, Topic: Volumetric Segmentation of Medical Images using a Semi-supervised statistical approach.
- Ph.D. Student, Hannah Aizenman, completed courses, survey course exam to be completed Spring 2016, Topic: Visualization of High Dimensional and Inhomogeneous Climate Data

Most of my upper-level courses having projects as a large component (typically 40% of the grade) but I have mentored many students outside of courses. Most of the high school students I have mentored have been part of NOAA-CREST outreach programs although word-of-mouth has resulted in some informal mentoring. Some projects listed below contributed to funded research projects and where possible, students were co-authors on papers. In some cases, students asked to do an independent study project, in others they worked as part of NOAA-CREST. Occasionally students came with projects they wanted to be mentored on or wanted to expand their knowledge in web technology, or data science based on courses I taught, research or word-of-mouth recommendation from other students.

Key: undergraduate (UG), masters (MS), doctoral (PhD) and high school (HS) students.

- Sam Inniss (UG), "Linked Web Visualization with Multi-Dimensional Scaling", 2015
- Kaitlyn Chait (UG), Jason Azayev (HS), "Science on a Sphere in the Oculus Rift", (Won Best Project at CUNY Summer STEM Research Symposium) 2015
- Jason Veloz (HS), Kunjben Patel (HS), "K-Means Based Clustering to Find Local Climate Regions", 2015
- Calvin Chu (UG), "Web based Interface for the Sea Ice Product Monitor", 2015
- David Leonard (UG), "Graphyte Notification System: Caesium", 2015
- Julia Marina (MS), "Mobile App using NYC public data on Google Play: StreetParkingNYC", 2014
- Indrajit Gurung (UG), "Water Classification using VIIRS Day and Night Band and Thermal Bands", 2014
- Ian McBride, 2013-2014
- Liron Shimrony (UG), "A web based interface for Semi-Automatic Adaptive Statistical Segmentation (SAASS)", 2014
- Andrew Fitzgerald (UG), "Multidimensional Analysis of Precipitation and Inundation in the Mekong River Delta", 2014

- Evan (Avi) Mosseri (HS) & Paata Ugrekhelidze (HS), "A Temporal Analysis of the Correlation Between Precipitation and Inundation in the Amazon River Delta", 2014
- Jonathan Reyes (UG), "Testing and integration for the Aurum automated assessment system", 2013
- George Yau (UG), "Web-based interface for Learning Module Bundling", 2013
- Walid Stone (MS), "Integrating LDAP for unified Authentication for the Aurum automated assessment system", 2012
- Yuriy Stejko (UG), "Developing an Installer, and Learning Module Builder for the Aurum automated assessment system", 2012
- John Wong (UG), "Aurum, a system for Automated Assessment of Computational Student Problems", 2012
- Jeremy Neiman (UG), "Graphyte software for integrated remote sensing research using HPCC", 2012
- Luis Bello (UG), Jaja Nyameke (HS), & Lisa Maldonado (HS), "Automatically Evaluated Learning Modules for Earth and Atmospheric Science", 2012
- Miroslav Shubernetskiy (UG), "Developing a Probabilistic Atlas for Volumetric Segmentation", 2011-2012
- Joesan Gabaldon (UG), "Graphyte-Betelgeuse, Next-Generation Graphyte", 2011
- Bangalee Dolly (UG), "Band 6 Restoration for Snow Mask, Yellowstone Case Study", 2011
- Andrew Tan (HS), Jamie Abad (HS), and Ezra Rodriguez (HS), "Information Technology and Programming Practice in NOAA-CREST", 2011
- Andrew Cole (UG), "Clustering Analysis for Cloud Classification", 2011
- Rezwana Uddin (UG), "Graphyte, Web-based Execution of Scientific Computation Experiments", 2010
- George Bonev (MS), "Water Discharge Regime Clustering", 2010
- Fazlul Shahriar (MS), "GOES-R RGB Prediction Using XYZ Color Space", 2010
- Paul Alabi (MS), "Applications of Statistical Data Analysis to Satellite Remote Sensing," 2010
- Carl Chinatomby (UG), "Automated Software Testing and Deployment subheading: Graphyte Web Toolkit", 2010
- Tence George (UG), "Comprehensive Comparison Compression Algorithms on Multi-spectral Satellite Image Data", 2009
- Gene Yu (Co-Mentor, PhD), "Think Globally, Cluster Locally: A Unified Framework for Range Segmentation", 2008
- Jason Hu (PhD), "Semi-Automatic Medical Image Segmentation with Adaptive Local Statistics in Conditional Random Field Framework", 2008
- Hannah Aizenman (UG), "Comparison of Image Segmentation for Multi-Spectral Images", 2008

- Malka Rabinowitz (UG), "Databased Backed Comparative Compression Studies", 2008
- Jamal Goddard (UG), "Comparative Compression Studies", 2007 (Undergraduate)
- Payam Hagh (UG), "Features for Image Search", 2007
- Damien Harrigan (UG), "Web based interface for Imaged Based Search", 2007
- Adrien Nicholas (UG), "Architecture for Searching Satellite Images", 2007
- Mayumi Togawa (UG), "Fast Search using the Nayar-Nene Nearest Neighbor Search", 2007
- Feiad Mohammed (UG), "Comparative Compression Studies", 2006
- Rafal Sytek (UG), "Texture Synthesis Based Compression", 2006
- Greg Wayne (UG), "Schizophrenia Brain Classification Using Support Vector Machines", 2006
- Chaim Sanders (HS), "Open GL based Projector Simulator", 2005
- Matthew Johnson (PhD.), "Sensitivity of Photometric Stereo to Quantization", "The appearance of Wet Roads", 2004-2005

(3) Student development activities (e.g. career options and resume workshops, alumni networking events, etc.)

- Helped organize Spring 2013 panel on Careers in CS.
- Work with Zahn Center to help students start companies.
 - Mentored Jeremy Neiman, "Deadbeat Drums team", Zahn Prize Winner 2013
 - Mentored Teona Lavashvili and Amali Nasserddine, "Laddine", Zahn Prize Winner 2014
 - Mentored Shawn Augustine, Build on the Go, Zahn Prize Winner 2015
 - Mentoring Moustafa Elshaabiny and Angela Choi, "Sensei", Standard Chartered WOMEN + TECH4NYC Prize Semi-Finalist

(4) Advising activities for student associations and societies

Work with the student ACM chapter advising on events and special interest group projects.

9. SERVICE AT THE CITY COLLEGE AND THE CITY UNIVERSITY

- (1) Service and contributions in leadership positions (e.g. Chair, Program Director, etc.)
- (2) Service on departmental, divisional, College, and University-wide committees
 - Curriculum Committee, 2006-2009, 2015-Present

- Grove School of Engineering Grad. Committee on Course & Standing, 2013-Present
- Faculty Advisory Committee of the Data Science @ CUNY, 2015-Present
- Elections Committee of CS at CUNY Graduate Center, Replacement 2015
- Committee member for CUNY Collaborative Incentive Research Grant (CIRG) Program, 2014
- Panel on First Programming Course at CUNY CS Discipline Council Meeting, 2010
- Search Committee for CS/EE GIS, 2008
- Served on the CCNY, Einsteins in the City review committee in 2006

10. OUTREACH ACTIVITIES

- (1) K-12 outreach activities
 - Mentoring High School Students during summer since 2005, Currently through NOAA-CREST HIRES program.
- (2) Community outreach activities and other related volunteer work
 - Education committee of the Solomon Schechter School of Manhattan (K-8)