Chrysanthe Preza

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Education

Washington University in St. Louis, St. Louis, MO:

- Doctor of Science in Electrical Engineering, August 1998. Dissertation title: "Phase Estimation Using Rotational Diversity for Differential Interference Contrast Microscopy." Advisor: Donald L. Snyder.
- Master of Science in Computer Science, August 1991. Focus on artificial intelligence, digital image processing, computer systems organization, and formal concepts in computer science.
- Master of Science in Electrical Engineering, August 1990. Thesis title: "A Regularized Linear-Reconstruction Method for Optical Sectioning Microscopy." Advisor: Michael I. Miller.
- Bachelor of Science in Computer Science, cum laude, May 1987.
- Bachelor of Science in Electrical Engineering, cum laude, May 1987.

Professional Experience

Conducting research in information-theoretic image processing applied to light microscopy and spectroscopy, and teaching a variety of electrical and computer engineering courses. Extensive experience in developing physics-based imaging models and processing methods for real imaging applications and implementation and testing of the methods via software engineering. Development and evaluation of optical systems and computational methods using the computational optical sensing and imaging (COSI) paradigm for different applications. Projects include: a) two-, three-, and four-dimensional computational imaging microscopy for two different modalities: fluorescence, and differential interference contrast (DIC aka Nomarski); b) instrument development of an adaptive multimodal microscope system; c) development of sensors for material identification, detection and characterization; and d) development of an image-plane coded aperture terahertz imaging device for biological applications.

a. Summary of Appointments

2010 - present	**Associate Professor**, The University of Memphis, Dept. of Electrical and Computer Engineering (primary) and Dept. of Biomedical Engineering
2006 - 2010	**Assistant Professor**, The University of Memphis, Dept. of Electrical and Computer Engineering (primary) and Dept. of Biomedical Engineering
2006 – present	**Adjunct Faculty,** The University of Tennessee Health Science Center, Orthopedic Surgery and Biomedical Engineering

2000 - 2006	**Research Associate**, Washington University, Electronic Signals and Systems Research Laboratory, Dept. of Elect. and System Engineering
2000 - 2006	**Instructor**, Washington University, Dept. of Elect. and System Engineering
2003 - 2004	**Visiting Assistant Professor**, University of Cyprus, Dept. of Electrical and Computer Engineering
1998 - 2000	**Research Associate,** Washington University, Institute for Biomedical Computing (IBC)
1987 - 1998	**Research Assistant,** Washington University, IBC

b. Responsibilities and Activities
The University of Memphis, Memphis TN:

<u>Associate Professor, Department of Electrical and Computer Engineering (primary) and Dept. of Biomedical Engineering, Aug. 2010 – present; Assistant Professor, Department of Electrical and Computer Engineering (primary) and Dept. of Biomedical Engineering, Aug. 2006 – present.</u>

- Conducting research in computational imaging applied to light microscopy. Modeling for three-dimensional depth-variant fluorescence microscopy imaging and correction of depth-induced aberrations. Point-spread function engineering and algorithm development integrated to a computational optical sensing and imaging (COSI) system for improved system performance.
- Model and algorithm development for quantitative DIC (Nomarski) microscopy.
- Development, maintenance and dissemination of the Computational Optical Sectioning Microscopy Open Source (COSMOS) software package (http://cirl.memphis.edu/cosmos).
- Establishment of the Computational Imaging Research Laboratory (CIRL).
- Development and testing of a platform-independent software package (COSMOS) with a VTK graphical user interface for Computational Optical-Sectioning Microscopy to be disseminated as open source software.
- Participation in completed collaborative projects with faculty (R. Piestun and C. Cogswell) at the University of Colorado, Boulder
- Involvement in collaborative and interdisciplinary research in bioimaging with collaborators Christopher M. Waters at the University of Tennessee Health Science Center (UTHSC) in Memphis.
- Involvement in collaborative and interdisciplinary research in biological investigations with collaborator Omar Skalli (Biological Sciences Dept. at the University of Memphis).
- Participated in a project for the development of an image-plane coded aperture terahertz imaging device for biological applications with Orges Furxhi and Eddie Jacobs.
- Participated in a project for the development of sensors for material identification, detection and characterization with Steve Griffin (PI) and Aaron Robinson (co-PI).
- Participated in a project that studied Nyquist limited infrared detectors. The research team included Eddie Jacobs (PI), Carl Harlford, Aaron Robinson, Srikant Chari and C. Preza.
- Participation in preparation and submission of external and internal grant proposals (see **Active, Pending, and Completed Research Support** listed below).
- Dissemination of research results through publications, conference presentations and invited seminars.
- Supervising and coordinating research activities of a post-doctoral fellow, 3-5 graduate students and 1-2 undergraduate students.
- Participation in the MemphiSTEM Undergraduate Research Program, 2010 – present.
- Teaching a variety of electrical and computer engineering courses. A list of courses is provided below under **Courses Taught**.Recruitment of graduate students. Recruitment of students from

underrepresented groups to Electrical and Computer Engineering.
- Academic advising and mentoring of undergraduate and graduate students and post-doctoral fellows.
- Graduate Program Coordinator of the EECE Department: Aug 2013 – present.
- Serving on numerous Committees within the Department, the College and the University.
- Organization of the EECE Departmental Seminar Series.
- Participation in the scientific program committee and organization committee of the Memphis BioImaging Symposium (2007 to present) http://www.membis.org/.
- Participation in the Girls Experiencing Engineering program at the University of Memphis.
- Affiliate faculty in the Center of Advanced Sensors (CAS) in the Herff College of Engineering at the UoM. Research in the CAS deals with imaging for defense applications.
- Affiliate faculty in the Center for Research on Women (CROW) http://www.memphis.edu/crow/about.htm and participation in the Women's Academic Network (Jan. 2009 – present).

Washington University in St. Louis, MO:
Research Associate, Electronic Systems and Signals Research Laboratory, Sept. 2000 – Aug. 2006.
- Development of computational methods for measuring 3-Dimensional Cell Attributes with DIC microscopy as part of the development of a quantitative DIC microscope.
- Participation in the development of a noninvasive hyperspectral device for real time imaging and characterization of living tissues and systems of biomedical importance. The device will integrate interferometric sensors, focal plane arrays, a computer cluster, and novel computational methods for data processing to extract spectral information.
- Development of calibration methods for data acquired with focal plane arrays in high performance environments.
- Development of a maximum-likelihood restoration method based on a depth-variant imaging model for three-dimensional fluorescence microscopy.
- Participation in the information-theoretic signal and image processing research thrust of the Center for Security Technologies (http://www.cst.wustl.edu).
- Participation in the development of an imaging model for the hyperspectral-imaging sensor Discrete Array Scanning Interferometer (DASI) and in spectrum estimation from quantum-limited interferograms acquired with the DASI.
- Investigation of possible improvements for parametric blind deconvolution methods applied to fluorescence microscopy.
- Participation in the preparation of grant proposals (see **Active, Pending, and Completed Research Support** listed below**)**

Instructor, Electrical and Systems Engineering Department, Sept. 2000 – Aug. 2006.
- Taught one or two courses per semester; A list of courses is provided below under **Courses Taught**.Served on the committee preparing for the 2006 ABET renewal of the 3 degree programs in the Electrical and Systems Engineering department. Collection and organization of the required material and participation in writing the Self-study Questionnaire Report.

Research Associate, Institute for Biomedical Computing (IBC), August 1998 - June 2000.
- Participation in the development and evaluation of a Computational Optical-Sectioning

Microscopy (COSM) data-acquisition system equipped with two CCD cameras allowing concurrent dual imaging at two different emitted wavelengths.

- Development and testing of improved COSM restoration methods. Updating the XCOSM software package and maintaining its dissemination through the Internet (http://www.essrl.wustl.edu/~preza/xcosm).
- Continued development and testing of phase estimation methods for Differential Interference Contrast (DIC) Microscopy.
- Participation in the preparation of grant proposals.

Research Assistant, Biomedical Computer Laboratory, IBC, July 1987- July 1998.
- Participated in the development and evaluation of a COSM system: a conventional light microscope equipped with a computer-controlled stepping motor and cooled CCD camera that enables three-dimensional data acquisition over time.
- Development and testing of imaging models and image-restoration methods for the reduction of out-of-focus light in three-dimensional images acquired with optical-sectioning fluorescence microscopy.
- Participation in the development, dissemination, and maintenance of the XCOSM software package; XCOSM features five COSM restoration methods.
- Development and evaluation of imaging models for Nomarski DIC Microscopy. Development of a robust phase estimation method based on these models and utilizing rotationally diverse DIC images (i.e. DIC images acquired by rotating the underlying specimen around the optical axis).
- Participation in the preparation of successfully funded grant proposals for Research Projects 1-3 listed below under **Completed Research Support**.

University of Cyprus, Nicosia, Cyprus:
Contributing to the development of the Electrical and Computer Engineering (ECE) Department of the newly established School of Engineering at the University of Cyprus, while full filling the home-country residency immigration requirement for permanent residency in the USA. Title and responsibilities were:

Visiting Assistant Professor, Electrical and Computer Engineering Dept., Sept. 2003 – June 2004
- Instruction of one course per semester.
- Development of the ECE curriculum and graduate programs.
- Investigation of possible improvements of *fluorescence in situ hybridization* (FISH) images from chromosomes by computational methods in collaboration with the Cyprus Institute of Neurology and Genetics.

Consulting and Industrial Experience
Ikonisys, Inc., New Haven, CT , September 2004 - January 2005:
Assessing the quality of three-dimensional data acquired with wide field fluorescence optical-sectioning microscopy for the identification of chromosomes in fluorescence in situ hybridization (FISH) images. Processing FISH images with our computational methods, in order to remove degradations due to the optical system, the CCD camera, and fluorescence photo bleaching.

Support

The external funding from NSF for which I am the principal investigator (PI) to date totals **$1,927,706.00**.

Active Research Support

1) Title: "*CAREER: Integrated computational optical framework for quantitative space-variant imaging in live-cell fluorescence microscopy*", PI: Chrysanthe Preza, Collaborators: C. Waters, Univ. of Tennessee Health Science Cente, R. Fischer NBHL,

Agency: National Science Foundation; Type: CAREER

Period: 03/01/09 - 2/28/15; Funds: **$ 791,402.00** (includes a 1 year no-cost extension)

Person-Months Per Year Committed to the Project: 2 summer months

The goal of this project is to develop new computational methods to account for aberrations due to "thick" biological specimens. The methods will be integrated with a novel optical non-scanning imaging system design to enable fast live-cell fluorescence microscopy imaging with high, isotropic 3D resolution.

2) Title: "*IDBR TYPE A - Improving 3D resolution and reducing sensitivity to spherical aberration in live, thick sample cellular imaging using novel methods in optical sectioning microscopy*", PI: C. Preza; Collaborators: O. Skalli, Univ. of Memphis, G. Saavedra and M. Martinez-Coral, Univ. of Valencia, Spain; C. Waters, Univ. of Tennessee Health Science Center

Source of Support: National Science Foundation   Type: Instrument Development

Total Award Amount: **$ 750,096.00**

Total Award Period Covered: 09/01/14 - 08/31/17

Location of Project: The University of Memphis

Person-Months Per Year Committed to the Project: 1.71 Summer months on the average

This project is to develop a robust and flexible computational optical system with improved 3D resolution and reduced sensitivity to depth-induced aberrations that will greatly extend the capabilities of optical-sectioning microscopy for use in a wide range of biological applications.

Completed Research Support

During the last 6 years I participated in the preparation of the following proposal(s) and in carrying out the research involved:

1) Title: "*Collaborative Research: Quantitative DIC Microscope for Measuring 3-Dimensional Cell Attributes*", Principal Investigator: Chrysanthe Preza

PI at UC: C. Cogswell, University of Colorado at Boulder. Co-Investigators: R. Piestun, and T. T. Su, University of Colorado at Boulder

Agency: National Science Foundation; Type: Instrumentation and Instrument Development

Period: September 1, 2005 – August 31st, 2009 (includes a year of no-cost extension);
Funds for C. Preza: **$ 217,256.00**

Person-Months Per Year Committed to the Project: 2 summer months

This project developed an integrated optical and digital system that greatly extends the capabilities of differential interference contrast (DIC) microscopy for use in a wide range of biological applications.

2) Title: "*Collaborative Research: Multimode adaptive 3D microscopy for quantitative analysis of*

live-cellular dynamic processes in thick samples", PI: Chrysanthe Preza,
PI at University of Colorado at Boulder (leading institution): R. Piestun.
Collaborators: C. Waters, UTHSC, R. Fischer NBHL
Agency: National Science Foundation; Type: Instrumentation and Instrument Development
Period: 06/01/09 - 05/31/13 (includes a year of no-cost extension); Funds for C. Preza: **$168,952.00**
Person-Months per Year Committed to the Project: 0 summer months
The goal of this project was to investigate, develop, and evaluate a computational optical imaging and sensing system based on multi-modal microscopy with greatly enhanced three-dimensional resolution that will allow biologists to visualize and measure live-cellular dynamic processes in thick samples that might otherwise go undetected. The utility of the device will be evaluated by investigating the capacity for detecting the remodeling of cytoskeletal proteins such as actin during cell migration in wound healing, and by its utility in the development of cellular morphodynamic profile analysis tools.

3) Title: "*Sensors for Material Identification, Detection and Characterization*", PI: Steve Griffin
Agency: Arkansas State Univ.; Period: 07/01/10 - 02/19/12; Funds for C. Preza (Co-PI): **$27,000.00**
Person-Months per Year Committed to the Project: 10% of AY time and 1/2 summer month
This project is to develop engineering designs for integrated technologies for field use of enhanced dual pulse LIBS and CW-CRD infrared capability and assess the applicability of these designs for incorporation into a screening portal or a remotely operated autonomous robot.

3) Title: "*Distributed Intelligence in Biologically-Motivated Multi-Agent Systems for Employment in Complex Warfare Scenarios and in Hostile Environments*", R. Kozma (PI); K. Ifterkharuddin (Co-PI) ; L. Wang, C. Preza, M. Yeasin (Research team members)
Type: FedEx Institute of Technology (at The University of Memphis) Research Grant
Period: 8/2008 - 6/2009; Funds for C. Preza: **$12,000.00**

4) Title "Analysis and Modeling of Nyquist Limited Infrared Detectors", PI: Eddie Jacobs; C. Halford, S, Chari, A. Robinson, and C. Preza (Research Members).
The goal of this project is to develop physics based models and simulations of image formation in the presence of turbidity. The project focuses on sub-wavelength detectors, propagation in turbid media (Dust/Propeller wash) and on the development of equivalent NVThermIP inputs to model these effects. In addition, image processing algorithms for mitigating the effects of the obscurant will be evaluated.
Company: Northrop Grumman Systems Co.
Period: March 2010 – November 2010; Funds for Preza: **$16,725.00**
Person-Months Per Year Committed to the Project: 1 summer month

Academic Honors
- Undergraduate Studies Scholarship, the Cyprus-America Scholarship Program (CASP) of the Cyprus Fulbright Commission, awarded for academic excellence and providing full tuition at Washington University in St. Louis and monthly stipend, 1983-1987.
- Tau Beta Pi and Eta Kappa Nu, Engineering Honoraries, 1986.
- B.S.E.E. cum laude, B.S.C.S. cum laude, 1987.

- Journal of the Optical Society of America Publications Award, July 1999.
- Best Poster Award, Memphis BioImaging Symposium, 2009.
- NSF CAREER Award, 2009.
- Outstanding Faculty Research Award, Herff College of Eng., the Univ. of Memphis, 2010.
- Montclair Who's Who in Collegiate Faculty, 2010-2011.
- Marquis Who's Who in America, 65th Edition, 2011.
- Recipient of the Ring Faculty Award, Herff College of Engineering, 2011-2013.
- Minorities and Women in Science Interview Series, OSA, April 2012
  http://www.osa.org/membership/grants_recognitions_special_services/mwosa/profiles
- University of Memphis PI Millionaire, 2014

Additional Professional Activities

- Co-Chair (2015) and Program Committee Member, *Computational Optical Sensing and Imaging,* OSA, Imaging and Applied Optics Congress, 2011 – present.
- Conference Session Chair, Focus in Microscopy 2014, Sydney, Australia.
- Conference Session Chair, *Phase: Multimodal microscopy*, in *Focus on Microscopy*, Maastricht, the Netherlands, 2013.
- Invited Participant, *IEEE Engineering in Medicine and Biology Society (EMBS) Forum on Grand Challenges in Biomedical Imaging*, March 1-2, Bethesda, Maryland, 2012.
- Program Committee Member, *IEEE International Conference of Electro/Information Technology,* IUPUI, Indianapolis, May 6-8, 2012.
- Invited Participant, *Workshop on Computationally Enhanced Optical Imaging*, Northeastern University, Boston, MA, Aug. 30, 2011.
- Invited Lecturer, *I-CAMP 2011 School*, Argentina-Uruguay, May 28-June 17, 2011.
- Program Committee Member, *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing*, BiOS, SPIE Photonics West, 2008 – present
- Conference Session Chair, *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing*, BiOS, SPIE Photonics West, CA, 2003, 2008, 2010-2012.
- Conference Session Chair, *Medical Image Processing I*, Digital Image Processing and Analysis (DIPA), OSA Imaging and Applied Optics Congress, Tucson, Arizona, 2010.
- Program Committee Member, *International Conference on Computational Photography* (*ICCP*), IEEE, MIT, 2010.
- Conference Session Chair, *Confocal, Multiphoton, and Nonlinear Microscopic Imaging*, European Conferences on Biomedical Optics, OSA and SPIE, Munich, 2007.
- Scientific and Organizing Committee Member, *Memphis BioImaging Symposium* (*MemBIS*), 2007 – 2013
  Conference Co-Chair, 2011-2013; Scientific Program Chair, 2010; Pre-conference Workshop Chair, 2009; Student Program co-Chair, 2008
- Invited Participant, *NSF ADVANCE Community Building Workshop for Junior Women Faculty in Engineering*, July 21 – 24, Virginia Beach, VA, 2009.
- **Scientific Reviewer/Particiation in Proposal Review Panels** for the following:
  Journal of the Optical Society of America, Applied Optics, Optics Express

IEEE Transactions on Image Processing, Journal of Microscopy
Central European Journal of Physics
IEEE International Symposium on Biomedical Imaging, 2011 – present
OSA Computational Optical Sensing and Imaging Conference, 2011 – present
<u>*NSF Proposals*</u> *in Advances in Bio Informatics* 2010 – present
<u>*NSF Proposals*</u> *in Instrument Development for Biological Research* 2014-present
<u>*NIH Proposals*</u> *in Enabling Bioanalytical & Imaging Technologies* 2011 – present

- **Professional Affiliations** (Current and Past)
  Member, Institute of Electrical and Electronics Engineers (IEEE)
  Member, IEEE Women in Engineering
  Member, Optical Society of America (OSA)
  Member, International Society for Optical Engineering (SPIE)
  Member, The Society of Women Engineers (SWE)
  Member, American Society for Engineering Education (ASEE)
  Member, Microscopical Society of America

Publications (Available online at http://cirl.memphis.edu)

Book Chapter

Preza, C., King, S. V., Dragomir, N. M., Cogswell, C. J., "Phase Imaging Microscopy – Beyond Darkfield, Phase and Differential Interference Contrast (DIC) Microscopy," in *Handbook of Biomedical Optics*, Boas, D. A., Pitris C., and Ramanujam, N., eds., Taylor and Francis Books, 2011. (Invited chapter)

Journal Publications

1. Ghosh, S. and **Preza, C.**, "Characterization of a 3D DH-PSF for fluorescence microscopy in the presence of spherical aberration," *Journal of Biomedical Optics,* 18(3):036010, 2013.
2. Furxhi, O., Jacobs, E. L. and **Preza, C.,** "Image plane coded aperture for Terahertz imaging," *Optical Engineering*, 51(9), 091612-1, 2012.
3. Yuan, S. and **Preza, C.**, "Point-spread function engineering to reduce the impact of spherical aberration on 3D computational fluorescence microscopy imaging," *Optics Express,* 19(23), 23298-23314, 2011.
4. King, S. V., Libertun, A. R., Piestun, R., Cogswell, C. J., **Preza, C.**, "Quantitative phase microscopy through differential interference imaging," *Journal of Biomedical Optics*, Vol. **13**(2), 024020, 2008.
5. Fox, D. J. Jr., Tysver Velde, H., **Preza, C.**, O'Sullivan, J. A., Smith, W. H., and Woolsey, T. A., "Computational hyperspectral interferometry for studies of brain function: proof of concept," *Applied Optics*, Vol. 45, No. 13, 3009-3021, May 2006.
6. Preza, C. and Conchello, J.-A. "Depth-Variant Maximum-Likelihood Restoration for Three-Dimensional Fluorescence Microscopy," *Journal of the Optical Society of America A*, Vol. 21, No. 9, 1593-1601, September, 2004.
7. Fuhrmann, D. R., **Preza, C.**, O'Sullivan, J. A., Snyder, D. L., and Smith, W.H., "Spectrum Estimation from Quantum-Limited Interferograms," *IEEE Transactions on Signal Processing,*

52(4), 950-961, April, 2004.

8. Homem, M. R. P., Mascarenhas, N. D. A., Costa, L. F., and **Preza C.**, "Biological Image Restoration in Optical-Sectioning Microscopy Using Prototype Image Constraints," *Real Time Imaging*, special issue on *Imaging in Bioinformatics*, 8(6), 475-490, 2002.

9. Preza, C., "Rotational-diversity phase estimation from differential-interference-contrast microscopy images," *Journal of the Optical Society of America A,* 17(3), 415-424, 2000.

10. Preza, C., Snyder, D. L., and Conchello, J.-A., "Theoretical development and experimental evaluation of imaging models for differential-interference-contrast microscopy," *Journal of the Optical Society of America A,* 16(9), 2185-2199, 1999.

11. McNally, J. G., **Preza, C**., Conchello, J.-A., and Thomas, Jr., L. J., "Artifacts in Computational Optical-Sectioning Microscopy," *Journal of the Optical Society of America A,* 11(3):1056-1067, 1994.

12. Preza, C., Ollinger, J. M., McNally, J. G., and Thomas, Jr., L. J., "Point-Spread Sensitivity Analysis for Computational Optical-Sectioning Microscopy," *Micron and Microscopica Acta*, Special issue, 23(4):501-513, 1992. (Invited paper).

13. Preza, C., Miller, M. I., Thomas, Jr., L. J., and McNally, J. G., "Regularized Linear Method for Reconstruction of Three-Dimensional Microscopic Objects from Optical Sections," *Journal of the Optical Society of America A*, 9(2):219-228, 1992.

Journal Publications Under Revision

1. Doblas, A., King, S. V., Patwary, N., Saavedra, G., Martinez-Corral, M. and **Preza, C.**, "Application of SQUBIC PSF design to 3D wide-field fluorescence microscopy reduces depth variability in image formation", to be *re-submitted* February 2015.

2. King, S. V., Doblas, A., Patwary, N., Saavedra, G., Martinez-Corral, M. and **Preza, C.**, "Implementation of programmable point-spread function engineering for 3D computational image of thick fluorescent microscopic samples", to be *re-submitted* February 2015.

Journal Publications Under Preparation

1. Patwary, N., and **Preza, C.**, "Computational 3D Fluorescence Microscopy Imaging Accounting for Depth-Induced Spherical Aberrations", to be *submitted* February 2015.

2. Patwary, N., King, S. V., Doblas, A., Saavedra, G., Martinez-Corral, M. and **Preza, C.**, Reducing restoration artifacts introduced by optically thick specimens in deconvolution microscopy using wavefront coding", to be *submitted* March 2015.

3. King, S. V., Hossein, Md. S., Yuan, S. and **Preza C.**, "Performance of engineered PSFs for Extended Depth of Field Microscopy in the presence of SA evaluated through the computational imaging process", to be *submitted* April 2015.

4. Preza, C., Schaefer L. H., Schuster, D., Patwary, N. and Ghaffar, A., "Structured Illumination Microscopy in the Presence of Spherical Aberrations," to be *submitted* April 2015.

5. Preza, C. and O'Sullivan, J. A., "Quantitative phase and amplitude imaging using alternating minimization algorithms in Nomarski differential-interference contrast (DIC) microscopy", *to be submitted* May 2015.

6. Preza, C. and Valdimarsson, E., "Quantitative 3D cell imaging with fluorescence microscopy and the COSMOS software package", *to be submitted* 2015.

Peer-Reviewed Conference Publications

1. Ghosh, S., and **Preza, C.**, "A block-based forward imaging model for improved sample volume representation in computational optical sectioning microscopy," Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI, BiOS, SPIE 9330-29, *in press* 2015.

2. Patwary, N., King, S. V. and **Preza, C.**, "3D microscope imaging robust to restoration artifacts introduced by optically thick specimens," Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI, BiOS, SPIE 9330-23, *in press* 2015.

3. Hossain, Md S., King, S. V. and **Preza, C.**, "An integrated approach to determine prior information for improved wide-field imaging models from computational interference microscopy," Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI, BiOS, SPIE 9330-41, *in press* 2015.

4. Patwary, N. and **Preza**, C., "Computationally tractable approach to PCA-based depth-variant PSF representation for 3D microscopy image restoration," Classical Optics, , OSA Technical Digest (online), Computational Optical Sensing and Imaging paper CW1C.5, Optical Society of America, 2014. (http://dx.doi.org/10.1364/COSI.2014.CW1C.5)

5. Hossain, Md S., King, S. V. and **Preza**, **C**., "Enhanced Extended Depth-of-Field Microscopy via modeling of SLM effects on the applied phase mask," Imaging and Applied Optics, OSA Technical Digest (online), Imaging Systems and Applications paper IW4C.4, Optical Society of America, 2014. (http://dx.doi.org/10.1364/ISA.2014.IW4C.4)

6. King, S. V., Doblas, A., Patwary, N., Saavedra, G., Martínez-Corral, M. and **Preza**, C., "Implementation of PSF Engineering in High-Resolution 3D Microscopy Imaging with a LCoS (Reflective) SLM," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI,* BiOS, SPIE 8949-39, 2014. (doi:10.1117/12.2040723)

7. Doblas, A., King, S. V., Patwary, N., Saavedra, G., Martínez-Corral, M. and **Preza**, C., "Investigation of the SQUBIC phase mask design for depth-invariant widefield microscopy point-spread function engineering," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI,* BiOS, SPIE 8949-40, 2014. (doi:10.1117/12.2038610)

8. Patwary, N., Doblas, A., King, S. V. and **Preza**, C., "Reducing depth-induced spherical aberration in 3D widefield fluorescence microscopy by wavefront coding using the SQUBIC phase mask," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI,* BiOS, SPIE 8949-37, 2014. (doi:10.1117/12.2040191)

9. Ghosh, S., Schaefer, L., Schuster, D. and, **Preza, C.**, "Further developments in addressing depth-variant 3D fluorescence microscopy imaging," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI,* BiOS, SPIE 8949-26, 2014. (doi:10.1117/12.2045856)

10. King, S. V. and **Preza, C.**, "Experimental Verification of PSF Engineering Using a Spatial Light Modulator," *OSA Computational Optical Sensing and Imaging* (*COSI*) Conference, Arlington, Virginia, 2013.

11. Yuan, S. and Preza, C., "Computational 3D Microscopy Imaging Using a PCA Depth-Variant PSF Model," *OSA Imaging Systems and Applications (IS)* Conference, Arlington, Virginia, 2013.

12. Rahman, M. M., Schaefer, L., Schuster, D. and **Preza**, C., "Comparison of computational methods developed to address depth-variant imaging in fluorescence microscopy," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XX,* BiOS, SPIE 8589, id. 85890A 7, 2013. (DOI: 10.1117/12.2005227)

13. Yuan, S. and **Preza, C.**, "Reducing image artifacts due to depth-induced aberrations in extended depth-of-field microscopy using an engineered point-spread function," *OSA Computational Optical Sensing and Imaging* (*COSI*) Conference, Monterey, California, 2012.

14. Yuan, S. and **Preza, C.**, "Computational optical sectioning microscopy using an engineered PSF with reduced depth variability - proof of concept," Proc. of the *9th IEEE International Symposium on Biomedical Imaging,* 1739 – 1742, 2012.

15. Ghosh, S., Quirin, S., Grover, G., Piestun, R. and **Preza, C.**, "Computational imaging for fluorescence microscopy using double helix PSF engineering," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIX,* BiOS, SPIE 8227, 82270F, 2012.

16. Yuan, S. and **C. Preza**, "Point-spread function engineering to reduce the impact of depth-induced aberrations on high-NA 3D extended depth-of-field microscopy," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIX,* BiOS, SPIE 8227, 822702, 2012. (doi: 10.1117/12.908908)

17. Yuan, S. and **C. Preza**, "Performance evaluation of an image estimation method based on principal component analysis (PCA) developed for quantitative depth-variant fluorescence microscopy imaging," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIX,* BiOS, SPIE 8227, 82270H, 2012. (doi: 10.1117/12.909638)

18. Yuan, S. and C. Preza, "Point-spread function engineering to reduce the impact of depth-induced aberrations on widefield microscopy imaging," *OSA Computational Optical Sensing and Imaging* (*COSI*) Conference, Toronto, July 2011.

19. Ghosh, S. and **C. Preza**, "Frequency content of the double-helix PSF for 3D microscopy in the presence of spherical aberration," *OSA Computational Optical Sensing and Imaging* (*COSI*) Conference, Toronto, July 2011.

20. Preza, C., "Simulating Structure Illumination Microscopy in the Presence of Spherical Aberrations," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XVIII,* BiOS, SPIE 7904, 79040D, 2011.

21. Yuan, S. and **Preza, C.**, "3D Fluorescence Microscopy Imaging Accounting for Depth-Varying Point Spread Functions Predicted by a Strata Interpolation Method and a Principal Component Analysis", *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XVIII,* BiOS, SPIE 7904, 79040M, 2011.

22. Ghosh, S., Grover, G., Piestun, R. and **Preza, C.**, "Effect of double-helix point-spread functions on 3D imaging in the presence of spherical aberrations," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XVIII,* BiOS, SPIE 7904, 79041D, 2011.

23. Yuan, S., Chen, Y., **Preza, C.**, and Tang, C., "Study on blood-flow pulsation using laser speckle contrast imaging", *Dynamics and Fluctuations in Biomedical Photonics VI,* BiOS, SPIE 7898-15, 2011.

24. Mukherjee, A. and **Preza, C.**, "Computational 3D Fluorescence Microscopy Imaging", *Imaging Systems (IS), Imaging and Applied Optics*, OSA Optics and Photonics Congress, IWC2, 2010.

25. Myneni, V. and **Preza, C.**, "3D Reconstruction of Fluorescence Microscopy Image Intensities Using Multiple Depth-Variant Point-Spread Functions", *Digital Image Processing and Analysis (DIPA), Imaging and Applied Optics*, OSA Optics and Photonics Congress, DTuA2, 2010.

26. Preza, C. and O'Sullivan, J. A., "Implementation and evaluation of a penalized alternating minimization algorithm for computational DIC microscopy", *Computational Imaging VIII*, IS&T/SPIE Electronic Imaging, SPIE 7533, pp. 75330E-1 to 75330E-11, 2010.

27. Preza, C. and Myneni, V., "Quantitative depth-variant imaging for fluorescence microscopy

using the COSMOS software package," *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XVII,* BiOS, SPIE 7570, pp. 757003-1 to 757003-8, 2010.

28. Mukherjee, A., Myneni, V., Crosby, L. M., Waters, C. M., and **Preza, C.,** "Improved 3-D microscope imaging through computational methods", Memphis BioImaging Symposium, 2009.

29. Myneni, V. and **Preza, C.,** "Computational depth-variant imaging for quantitative fluorescence microscopy," *in Computational Optical Sensing and Imaging (COSI)*, OSA Technical Digest (CD), Optical Society of America, paper # CThC4, 2009.

30. Preza, C. and O'Sullivan, J. A., "Computational Differential Interference Contrast (DIC) Microscopy for Quantitative Imaging," *in Computational Optical Sensing and Imaging (COSI)*, OSA Technical Digest (CD), Optical Society of America, paper # CThB5, 2009.

31. Preza, C. and O'Sullivan, J. A., "Quantitative phase and amplitude imaging using differential-interference contrast (DIC) microscopy ", *in Computational Imaging VII,* Charles A. Bouman, Eric L. Miller, Ilya Pollak, eds., Electronic Imaging, Proc. SPIE Vol. 7246, 724604, 2009.

32. O'Sullivan, J. A. and **Preza, C**., "Alternating Minimization Algorithm for Quantitative Differential-Interference Contrast (DIC) Microscopy", *in Computational Imaging VI,* Charles A. Bouman, Eric L. Miller, Ilya Pollak, eds., Electronic Imaging, Proc. SPIE Vol. 6814, 68140Y 2008.

33. Preza, C. and O'Sullivan, J. A., "Quantitative determination of specimen properties using computational differential-interference contrast (DIC) microscopy", *in Confocal, Multiphoton, and Nonlinear Microscopic Imaging III,* Tony Wilson, Ammasi Periasam, eds., Proc. SPIE-OSA Biomedical Optics, Proc. SPIE Vol. 6630, 66300E, 2007.

34. King, S. V., Libertun, A. R., **Preza, C.,** and Cogswell, C. J., "Calibration of a phase-shifting DIC microscope for quantitative phase imaging", in *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIV*, Proc. SPIE Vol. 6443, 64430M, 2007.

35. Preza, C., King, S. V., and Cogswell, C. J., "Algorithms for extracting true phase from rotationally-diverse and phase-shifted DIC images," in *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIII*, Proc. SPIE Vol. 6090, 60900E, 2006.

36. Fox, D. J. Jr., Woolsey, T. A., **Preza, C.,** O'Sullivan, J. A., Tysver Velde, H., and Smith, W. H., "Computational Hyperspectral Microscopy for Studies of Neural and Biological Function," in *Adaptive Optics: Analysis and Methods/Computational Optical Sensing and Imaging / Information Photonics / Signal Recovery and Synthesis Topical Meetings on CD-ROM* (The Optical Society of America, Washington, DC), presentation # CTuB2, 2005.

37. Preza, C., Patsalis, C. P., Sismani C., Evangelidou P., and Pitris, C., "Three-dimensional FISH Imaging of Chromosomes Using Computational Optical Sectioning Microscopy", *in Diagnostic Imaging and Image Analysis*, II Mediterranean Conference on Medical Physics, Limassol, Cyprus, April, 2004.

38. Preza, C. and Conchello, J.-A., "Image Estimation Accounting for Point-Spread Function Depth-Variation in Three-Dimensional Fluorescence Microscopy," in *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing X,* C. J. Cogswell, J.-A. Conchello, T. Wilson, eds., Proc. SPIE Vol. 4964, pp. 135-142, 2003.

39. Preza, C., van Munster, E. B., Aten, J. A., Snyder, D. L., and Rosenberger, F. U., "Determination of Direction-Independent Optical Path-Length Distribution of Cells Using Rotational-Diversity Transmitted-Light Differential Interference Contrast (DIC) Images," in *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing,*C. J. Cogswell, J.-A. Conchello, T. Wilson, eds., Proc. SPIE 3261A, 60-70, 1998.

40. Preza, C., Snyder, D. L., Rosenberger, F. U., Markham, J., and Conchello, J.-A., "Phase

Estimation from Transmitted-Light DIC Images Using Rotational Diversity," in *Image Reconstruction and Restoration II,* T. J. Schulz, ed., Proc. SPIE 317097-107, 1997.

41. Preza, C., Snyder, D. L., and Conchello, J.-A., "Image Reconstruction for Three-Dimensional Transmitted-Light DIC Microscopy," in *Three-Dimensional Microscopy: Image Acquisition and Processing IV,* C. J. Cogswell, J.-A. Conchello, T. Wilson, eds., Proc. SPIE 2984220-231, 1997.

42. Preza, C., Snyder, D. L., and Conchello, J.-A., "Imaging Models for Three-Dimensional Transmitted-Light DIC Microscopy," In Proceedings of the IS&T/SPIE Symposium on Electronic Imaging: Science & Technology, volume 2655, 245-257, 1996.

43. Preza, C., Miller, M. I., and Conchello, J.-A., "Image Reconstruction for 3-D Light Microscopy with a Regularized Linear Method Incorporating a Smoothness Prior," in *Biomedical Image Processing and Biomedical Visualization*, R. S. Acharya and D. B. Goldgof, Eds., Proc. SPIE 1905:129-139, 1993.

44. Preza, C., Ollinger, J. M., McNally, J. G., and Thomas, Jr., L. J., "Point-Spread Sensitivity Analysis for 3-D Fluorescence Microscopy," in *Biomedical Image Processing and Three-Dimensional Microscopy,* R. S. Acharya, C. J. Cogswell, and D. B. Goldgof, Eds., Proc. SPIE, 1660:158-169, 1992.

Other Conference Publications and Presentations

1. Patwary, N., King, S. V. and **Preza, C.**, "Improving 3D fluorescence imaging using a computational-optical approach to account for depth-induced aberrations," *in Quantitative BioImaging 2015*, Institut Pasteur, Paris, France, 2015.

2. Preza, C., Patwary, N., Doblas, A., King, S.V., Saavedra, G. and Martinez-Coral, M., "Addressing Depth-Induced Spherical Aberration in Computational Optical Sectioning Microscopy Using Wavefront Coding," *in Focus on Microscopy,* Sidney, Australia, April 13-16, 2014.

3. King S. V., Yuan, S., Dong, D. and **Preza, C.**, "Reducing the impact of spherical aberration on 3D microscopy imaging using programmable PSF engineering," *in Focus on Microscopy,* Maastricht, the Netherlands, March 24-27, 2013.

4. Yuan, S., and **Preza, C.**, "A new approach based on PSF engineering to reduce depth-induced aberration in 3-D fluorescence microscopy", *in Quantitative BioImaging 2013,* University of New Mexico, Albuquerque, New Mexico, 2013.

5. Yuan, S., and **Preza, C.**, "Reducing the impact of depth-induced spherical aberration on extended depth-of-field microscopy using PSF enginerring", *in Quantitative BioImaging 2013,* University of New Mexico, Albuquerque, New Mexico, 2013.

6. Preza, C., Schaefer, L. H., Schuster, D., Ghaffar, A.-U., Yuan, S., and Lobo, G. J., "Impact of Spherical Aberration on Structured-Illumination Microscopy", *in Focus on Microscopy*, Singapore, April 1-4, 2012.

7. Preza, C. and Yuan, S., "Reducing the Impact of Spherical Aberration on Extended depth-of-field Microscopy Using PSF Engineering", *in Focus on Microscopy*, Singapore, April 1-4 2012.

8. Preza, C., Yuan, S., Sporer, M. H., Mukherjee, A., Crosby, L. M., and Waters, C. M., "Investigating the use of structured-illumination microscopy as implemented in the Zeiss ApoTome attachment to image thick lung tissue slices", *in Focus on Microscopy*, Konstanz, Germany, April 2011.

9. Yuan, S., and **Preza, C.**, "A new approach to reduce depth-introduced aberration in 3-D microscopy", Memphis BioImaging Symposium (MemBIS), Memphis, 2011.

10. Preza, C., Ghosh, S., Grover, G., Quirin, S., Piestun, R., "Extraction of depth information in the presence of spherical aberration using double-helix point spread function coding in 3D fluorescence microscopy imaging", *in Focus on Microscopy*, Konstanz, Germany, April 2011.

11. Preza, C., Mukherjee, A., Myneni, V., Crosby, L. M., and Waters, C. M., "3D cell imaging with computational optical-sectioning microscopy and structured-illumination microscopy", *in Focus on Microscopy,* Shanghai, China, March 2010.

12. Ghosh, S., Grover, G., Piestun, R. and **Preza, C.**, "A New Paradigm in 3D Imaging Systems for Microscopy- Double-Helix Point Spread Functions", Memphis BioImaging Symposium (MemBIS), Memphis, 2010.

13. Mukherjee, A., Yuan, S., Sporer, M. H., Crosby, L. M., Waters, C. M., and **Preza, C.**, "A Study of Image Resolution in Images Acquired From Thick Rat Lung Slices Using Structured Illumination Microscopy", Memphis BioImaging Symposium (MemBIS), Memphis, 2010.

14. Yuan, S., Chen, Y., **Preza, C.**, and Tang, C.M., "Phantom Study on Blood-Flow Pulsation Using Laser Speckle Contrast Imaging", Memphis BioImaging Symposium (MemBIS, Memphis, 2010.

15. Myneni, V. and **Preza, C.**, "Computational imaging for depth-variant fluorescence microscopy," *in Focus on Microscopy,* Krakow, Poland, April 2009.

16. Preza, C., King S. V., Libertun, A. R., and Cogswell C. J., "Computational Imaging for DIC Microscopy: Current Use in Live-Cell Imaging", *in Focus on Microscopy,* Osaka-Awaji, Japan, April 2008.

17. Cogswell C. J., King S. V., Libertun, A. R., Piestun, R., and **Preza, C.**, "Quantitative DIC Microscopy: Improving Versatility for Live-Cell Imaging", *in Focus on Microscopy,* Valencia, Spain, April 2007.

Conference Publications under Preparation

1. King, S. V., Hossain, Md S., and **Preza, C**., "Dual acquisition of fluorescence and quantitative phase microscopy with high-speed switchable optics for DIC", *submitted* to Novel Techniques in Microscopy, OSA, 2015.

2. King, S. V., Skalli, O. and **Preza, C.,** "3D Imaging suitable for cellular uptake of spherical nanoparticles by accounting for spherical aberration," *submitted to* Focus on Microscopy 2015.

Other Invited Presentations

1. Preza, C., "Computational imaging for 3D fluorescence microscopy: beyond deconvolution microscopy," *Invited tutorial presentation at the Quantitative BioImaging 2015*, Institut Pasteur, Paris, France, 2015. (http://www.quantitativebioimaging.com/program/talks/)

2. Preza, C., "Computational Imaging for 3D Fluorescence Microscopy," *Invited seminar given at the Seminar Series of the Physics Dept.,* Rhodes College, January 24, 2014.

3. Preza, C., "3D point spread fucntion characterization for widefield fluorescence microscopy," *Invited tutorial presentation at the Quantitative BioImaging 2013*, University of New Mexico, Albuquerque, New Mexico, 2013.

4. Preza, C., "Advances in 3D Computational Imaging for Structured-Illumination Microscopy," *Invited seminar given at the Joint Biomedical Engineering Program of The Univ. of Memphis & The Univ. of Tennessee*, *Health Science Center*, Memphis, Tennessee, September 14, 2012.

5. Preza, C., "3D Fluorescence Microscopy Imaging Using Double-Helix Point-Spread Function Engineering," *Invited seminar given at the Optical Fibers and Signal Processing Group,* The Univ. of Valencia, Spain, July 5, 2012.

6. Preza, C., "New Computational Methods for Structured-Illumination Microscopy," *Invited seminar given at the Dept. of Optics,* The Univ. of Valencia, Spain, April 30, 2012.

7. Preza, C., "Quantitative 3D Fluorescence Microscopy Imaging Using Computational Methods," *Invited seminar given at the Seminar Series of the Dept. of Biological Sciences,* The Univ. of Memphis, Memphis, November 10, 2011.

8. Preza, C., "Computational Imaging Overview and Application to Microscopy," *Three invited lectures* given at the *I-CAMP 2011 School*, School of Engineering at the University of the Republic, Montevideo, Uruguay, May 28 - June 3, 2011. http://icamconferences.org/i-camp2011/

9. Preza, C., "Correction of Depth-Induced Aberrations in 3D Fluorescence Microscopy Imaging," *Invited seminar given at the Seminar Series of the Physics Dept.,* The Univ. of Mississippi, Oxford, April 26, 2011.

10. Preza, C., "Correction of Depth-Induced Aberrations in 3D Fluorescence Microscopy Imaging," *Invited seminar given at the Seminar Series of the Department of Electrical and Computer Engineering, Purdue School of Engineering and Technology,* Indiana University / Purdue University at Indianapolis, December 9, 2010.

11. Preza, C., "Correction of Depth-Induced Aberrations in 3D Fluorescence Microscopy Imaging," *Invited seminar given at the Seminar Series of the Department of Electrical and Computer Engineering,* The University of Alabama, Tuscaloosa, Alabama, November 19, 2010.

12. Preza, C., "Correction of Depth-Induced Aberrations in 3D Fluorescence Microscopy Imaging," *Invited seminar given at the Seminar Series of the Physics Dept.,* The Univ. of Memphis, Memphis, October 14, 2010.

13. Preza, C., "Alternating Minimization Algorithm for Quantitative Differential-Interference Contrast (DIC) Microscopy," *Invited seminar given at the Computational Optical Imaging and Sensing Seminar Series of the Electrical & Comp. Eng. Dept.,* Univ. of Colorado, Boulder, Colorado, October 13, 2008.

14. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Chemical Engineering Departmental Seminar Series,* Tennessee Technological University, Cookeville, Tennessee, September 30, 2008.

15. Preza, C., "Computational Optical Sectioning Microscopy," *Invited seminar given at the Electrical & Comp. Eng. Departmental Seminar Series,* Univ. of Colorado, Boulder, Colorado, March 6, 2007.

16. Preza, C., "Computational Imaging for Light Microscopy," *Invited seminar given at the Joint Biomedical Engineering Program of The Univ. of Memphis & The Univ. of Tennessee*, *Health Science Center*, Memphis, Tennessee, September 8, 2006.

17. Preza, C., "Computational Imaging for Depth-Varying Fluorescence Microscopy," *Invited seminar given at CDM Optics, Inc.,* Boulder, Colorado, March 17, 2006.

18. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Electrical & Comp. Eng. Dept.,* University of Colorado, Boulder, Colorado, March 14, 2006.

19. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Electrical & Comp. Eng. Dept.,* Michigan Technological Univ., Houghton, Michigan, February 16, 2006.

20. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Electrical & Comp. Eng. Dept.,* Texas A&M University, College Station, Texas, Nov. 4, 2005.

21. Preza, C., "Computational Imaging for Fluorescence Microscopy," *Invited seminar given at Ikonisys, Inc.,* New Haven, Connecticut, July 9, 2004.

22. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Electrical &*

Comp. Eng. Dept., Purdue University, West Lafayette, Indianapolis , May 5, 2003.

23. Preza, C., "Computational Imaging for Microscopy," *Invited seminar given at the Electrical and Computer Engineering Department,* University of Cyprus, Nicosia, Cyprus , March, 2003.

24. Preza, C., "Progress in Quantitative Differential-Interference-Contrast Microscopy Using Rotational-Diversity Phase Estimation," presented at *The Donald L. Snyder Workshop,* Washington University, St. Louis, MO, 2000.

25. Preza, C., "Phase Estimation Using Rotational Diversity for Differential Interference Contrast Microscopy," *Invited seminar given at the Electrical, Computer, & Systems Engineering Department,* Rensselaer Polytechnic Institute, Troy, New York, February 26, 1998.

26. Preza, C., "Computational Microscopy,"*Invited seminar given at The Cyprus Institute of Neurology and Genetics,*Nicosia, Cyprus, October 23, 1997.

27. Preza, C., "Imaging Models for Transmitted-Light DIC Microscopy", *Invited seminar given at the Center for Light Microscope Imaging and Biotechnology*, Carnegie Mellon University, Pittsburgh, Pennsylvania, July 10, 1996.

28. Preza, C., "Comparison of Image Restoration Algorithms," *Invited presentation given at the IBC's Tutorial on Image Restoration for Three-Dimensional Microscopy*, Institute for Biomedical Computing, Washington University, St. Louis, MO, April 26-27, 1996.

29. Preza, C., "Regularized Linear Method for Computational Optical-Sectioning Microscopy,"*Invited seminar given at the Center for Light Microscope Imaging and Biotechnology*, Carnegie Mellon University, Pittsburgh, Pennsylvania, April 2, 1992.

Service
At the Univ. of Memphis

University Council for Graduate Studies	Fall 2014 - present
Faculty Advisory Committee for Research	Jan. 2009
Center for Research on Women (CROW)- Affiliate Faculty	Jan 2012 - present
Herff College of Engineering Student Handbook Committee	Fall 2007
Herff College of Engineering Diversity Committee	Aug. 2006 - present
Herff College of Engineering Retention Committee	Aug. 2010 - present
Herff College of Engineering Graduate Coordinators Committee	Aug. 2013 - present
HCOE Graduate Studies Workflow Team	Aug. 2013 - present
Coordinator for Graduate Studies, EECE Dept.	Aug. 2013 - present
EECE Undergraduate Curriculum Committee	Aug. 2006 - 2013
EECE Graduate Curriculum Committee	Aug. 2006 – present
EECE Executive Committee	Aug. 2014 - present
Technical Area Group / ABET Committee	Jan. 2007 - present
Capstone Design Committee	2007 and 2009
EECE Seminar Series Committee	Aug. 2007 – present
MemphiSTEM Undergraduate Research Program	Jan. 2010 - present
Girls Experiencing Engineering (GEE) – Herff College of Engineering outreach education program	June 2010 & 2012

At Washington University

ABET Committee   Sep. 2004 - June 2006

Outreach Activities
- Local Chapter of the Daughters of Penelope, Education Committee, Chair, 2007- present
Responsibility: Review applications for University Education Scholarships and recommend scholarship recipient (http://www.ahepa.org/dop/).
- Center for Research on Women (CROW), Affiliate Faculty , 2009 –present
Supporting and participating in CROW events.
- Girls Experiencing Engineering (GEE), Instructor, June 2010 & 2012
Designed and instructed a two-day *Imaging Science Focus Session* with hands on activities for high school girls using our COSMOS software package.

Personal Information
Nationality: Greek; *Citizenship:* Cypriot
Current Residency: United States of America (permanent resident)
Eligible to work in the US: Yes
Languages: Fluent in English and Greek (speaking, reading, and writing)

Courses Taught
At Washington Univ., the Univ. of Cyprus and since fall 2006 and the Univ. of Memphis.
- **Introduction to Electrical and Computer Engineering** (freshman level course), spring 2003, fall 2003. Fundamental aspects of engineering including physics and physical devices, mathematical modeling, analytical problem solving, engineering design, and laboratory experimentation. Course topics and skills are integrated in design projects on contemporary applications.
- **Introduction to Information Technology** (freshman level course), spring 2004. Basic concepts on information representation (A/D conversion, binary representation), storage (magnetic, optical), transmission (wired, fiber-optic, radio and satellite), and security for various forms of information (audio, image, and video). Basic principles of operation for: high-tech devices (mobile phones, GPS devices etc.), telephone and computer networks, and the World Wide Web.
- **Introduction to Electrical Networks** (sophomore/junior level course), fall 2004, 2005, spring 2005, 2006. Elements, sources, and interconnects. Ohm's and Kirchhoff's laws, superposition and Thevenin's theorem; the resistive circuit, transient analysis, sinusoidal analysis, and frequency response.
- **Electrical and Electronic Circuits Laboratory** (sophomore level course), spring 2002, 2005, fall 2002. Lectures and laboratory exercises on introductory networks and basic electronics.
- **Signals and Systems I & II (Transform Methods or Signal Analysis for Electronic Systems and Circuits)** (junior level course), fall 2001, **fall 2006-2011, spring 2010-2012**. Elementary concepts of continuous-time and discrete-time signals and systems. Analysis of linear time-invariant systems: convolution, Fourier series, Fourier transforms, Laplace and Z transforms. Principles of sampling and modulation.
- **Communication Theory** (senior level course), **spring 2009, 2015 (**and spring 2001, 2002, and 2003 at Washington Univ.). Amplitude and angle modulation for the transmission of continuous-time signals. Analog-to-digital conversion and pulse code modulation. Transmission

of digital data. Introduction to random signals and noise and their effects on communication. Overview of various communication technologies.

- **Electrical Engineering Senior Design Projects** (senior level course), spring 1999. Working in teams, students address design tasks assigned by faculty (this semester, students were given specifications to design and build a motion detector). Projects are chosen to emphasize the design process, with the designers choosing one of several paths to a possible result. Collaboration with industry and all divisions of the University is encouraged.

- **Image Processing** (graduate level course), **fall 2012, spring 2014.** Theory and applications of digital image processing, sampling, quantization, enhancement and restoration of images; use of segmentation, descriptors, and pattern recognition; architectures for image processing.

- **Random Signals and Noise (**graduate level course), **fall 2012.** Statistical methods for describing and analyzing random signals and noise; auto-correlation, cross-correlation, and spectral density functions; optimal linear filter theory.

- **Fourier Optics** (graduate level course), **spring 2007- 2010**. Analysis of two-dimensional linear systems, scalar diffraction theory, Fresnel and Fraunhofer diffraction; Fourier transforming properties of lenses, spatial frequency analysis of optical systems, optical information processing and holography.

- **Professional Development/Research Methods**, (required graduate level course) fall 2014. Electrical and computer engineering research methods, development issues and ethics in academia and engineering practice. Students learn how to conduct literature search, write progress reports, publications, and proposals as well as prepare and give presentations.

- **Inverse Problems in Imaging/Computational Methods for Inverse Problems** (special topic graduate level course), **fall 2008, spring 2015.** A study of the principles of linear inverse problems, methods of their approximate solution, and practical application in imaging.

- **Computational Optical Imaging** (special topic graduate level course), **fall 2010.** A study of special topics in computational optical imaging including compressive sensing and wavefront encoding applied to microscopy to extend the depth of field, correct aberration and provide super resolution.

- Guest Lectures on "Computational imaging for 3D microscopy" as part of **Light Microscopy: Theory and Applications** (graduate level Biology course) **spring 2012**.

- Guest Lectures on "Optics of microscopes" as part of **Optical Imaging**(graduate level course), spring 1991, 1994, and 1997.

- Guest Lecture on "Three-dimensional microscopy and deconvolution" as part of **Optical Bioelectric Imaging** (graduate level course in Biomedical Engineering), fall 2005.

Research Collaborators
Current
Carol J. Cogswell – University of Colorado at Boulder
Joseph A. O'Sullivan – Washington University
Christopher Waters – Univ. of Tennessee Health Science Center
Robert S. Fischer – National Heart, Lung and Blood Institute
Vytautas Bindokas – The Univ. of Chicago
Jochen Tham – Carl Zeiss MicroImaging Inc.
Lutz H. Schaefer – Advanced Imaging Methodology Consultation, Canada
Dietwald Schuster - Hochschule Regensburg - University of Applied Sciences

Manuel Martinez-Coral – University of Valencia, Spain
Genaro Saavedra – University of Valencia, Spain
Omar Skalli – The University of Memphis
Sharon V. King – The University of Memphis

Past
Rafael Piestun – University of Colorado at Boulder
Donald L. Snyder – Washington University
William H. Smith – Washington University
Thomas A. Woolsey – Washington University
Jose-Angel Conchello – Harvard University Center for Brain Science
James G. McNally – National Cancer Institute, NIH
Robert Kozma –The Univ. of Memphis
Lan Wang –The Univ. of Memphis
Khan M. Iftekharuddin – Old Dominion Univ.
Mohammed Yeasin – The Univ. of Memphis
Srikant Chari –The Univ. of Memphis
Steven T. Griffin – The University of Memphis
Eddie Jacobs – The Univ. of Memphis
Orges Furxhi – The Univ. of Memphis
Aaron Robinson –The Univ. of Memphi
Badrinath Roysam – University of Houston
Stephanie Ivey –The Univ. of Memphis
Nicoleta Dragomir –Victoria University, Australia

Post-Doctoral Associates Supervised (Past)
Sharon V. King	Jing Zheng
Shuai Yuan	

Research Assistants Supervised (Past and Current)
The Univ. of Memphis
Graduate Students
Current
Sreya Ghosh	Nurmohammed Patwary	Hasti Shabani
Md. Shohag Hossain	Christopher A. Taylor	

Past
Vimeetha Myneni	Amaradri Mukherjee	Monica V. Zugravu	Matthew Bledsoe
Rakesh Duggirala	Abhilash K. Challa	Karththika R. Muthukuri	Gregorio Lobo
Siva P. Kinthada	Aaryani Tipirneni	Moshiur Rahman	M. Mizanur Rahman
Udaya Gollamudi	Yipin Zhou	Daqi Dong	

Undergraduate Students
Mark H. Sporer	Andrew Jenkins	Timothy Mathis
Gregorio Lobo	Christopher A. Taylor	

Washington University
Graduate Students
Sibo Li	Murillo R. Homem

References

The following persons can be contacted for more information about Chrysanthe Preza:

- **A former colleague and current collaborator at Washington University in St. Louis**
  Dr. Joseph A. O'Sullivan
  Samuel C. Sachs Professor of Electrical Engineering and
  Director of the Electronic Signals and Systems Laboratory
  Department of Electrical and Systems Engineering
  Washington University, Campus Box 1127
  1 Brookings Drive, St. Louis, MO 63130-4899
  E-mail: jao@ese.wustl.edu, phone: (314) 935-4173, fax: (314) 935-7500

- **Collaborator at the University of Colorado Boulder**
  Dr. Rafael Piestun
  Associate Professor
  Department of Electrical, Computer, and Energy Engineering
  The University of Colorado Boulder
  425 UCB, Boulder, CO 80309
  E-mail: cogswell@colorado.edu, Phone: (303) 492-2947, FAX: (303) 492-2758

- **My former Chair at the University of Memphis**
  Dr. David J. Russomanno
  Dean, Purdue School of Engineering and Technology, IUPUI
  Professor, Dept. of Electrical and Computer Engineering, IUPUI
  799 W. Michigan St., ET 219 E
  Indianapolis, IN 46202-5160
  Email: drussoma@iupui.edu, Phone: 317-274-0802 Office; 317-274-4567 Fax

- **My doctoral research advisor at Washington University in St. Louis**
  Dr. Donald L. Snyder
  Senior Professor, Department of Electrical and Systems Engineering
  Washington University, Campus Box 1127
  1 Brookings Drive, St. Louis, MO 63130-4899
  E-mail: dls@ese.wustl.edu, phone: (314) 780-5443

- **A former colleague and collaborator at the Institute for Biomedical Computing**
  Dr. James G. McNally
  Imaging Director
  Fluorescence Imaging Facility, Laboratory of Receptor Biology and Gene Expression
  National Cancer Institute, National Institutes of Health
  41 Library Drive, Room B602 MSC 5055, Bethesda, MD 20892
  E-mail: mcnallyj@exchange.nih.gov; Phone: (301) 402-0209