

Robert J. Plemmons

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Current Status

Reynolds Professor of Mathematics and Computer Science, Wake Forest University.

Education

Ph.D. in Applied Mathematics, Auburn University, 1965, NDEA Fellowship.
B.S. in Mathematics, (Physics Minor), Wake Forest University, 1961, Athletic Scholarship.

Research Interest/Expertise: Scientific Computation. Specifically: numerical linear algebra, imaging physics; optics, ill-posed inverse problems.

Prior Academic Employment Background

- 1968-81 Associate Professor, Professor, University of Tennessee. Served a term as Head of Computer Science Dept.
- 1981-91 Professor, N.C. State University. Founded the UNC Center for Research in Scientific Computation and served as Director.

Non-Academic Employment Background

- 1961-64 Professional baseball in Baltimore Orioles System (Spring and Summers).
- 1965-67 Research Scientist, National Security Agency.

Recent Research Grants

- Intelligence Advanced Projects Activity (IARPA): Funding from U.S. Intelligence Agencies, *A Practical Enhanced-Resolution Integrated Optical-Digital Imaging Camera (PERIODIC) System*, February 2005 to October 2009 (current). 20 percent time.
- Air force Office of Scientific Research (AFOSR), *Combining Imaging and Nonimaging Observations for Improved Space Object Identification*, April 2008 to March 2011 (current). 10 percent time.
- Army Research Office (ARO), *Innovative Methods for High Resolution Imaging and Feature Extraction*, July 2005 to July 2009 (current). 10 percent time.
- Army Research Office, *Computational Methods for Inverse Problems in Optical and SAR Imaging*, August 2000 to February 2007 (completed).
- Air Force Office of Scientific Research, *PRET Grant on Advanced Concepts in Space Situational Awareness*, January 2001 to July 2007 (completed).

Recent Relevant Publications

- D. Chen and R. plemmons, *Nonnegativity Constraints in Numerical Analysis*, **Proceedings of The Symposium on the Birth of Numerical Analysis**, Leuven Belgium, October 2007. To appear in the Conference Proceedings, to be published by World Scientific Press, A. Bultheel and R. Cools, Eds.

- R. Plemmons, S. Prasad, S. Mathews, M. Mirotznik, R. Barnard, B. Gray, P. Pauca, T. Torgersen, J. van der Gracht, G. Behrmann, *PERIODIC: Integrated Computational Array Imaging Technology*, Proc. Computational Optical Sensing and Imaging Symposium, OSA Conference, Vancouver, Canada, June 2007 (Invited Paper).
- M. Ng and R. Plemmons, *Blind Deconvolution and Structured Matrix Computations with Applications to Array Imaging*, Invited Chapter (46 pp.) in **Blind Image Deconvolution: Theory and Applications**, Edited by P. Campisi and K. Egiazarian, CRC Press, 2007.
- R. Barnard, P. Pauca, T. Torgersen, R. Plemmons, S. Prasad, J. van der Gracht, J. Nagy, J. Chung, G. Behrmann, S. Mathews and M. Mirotznik, *High-Resolution Iris Image Reconstruction from Low-Resolution Imagery*, Proc. Annual SPIE Conf., San Diego, CA (2006).
- P. Pauca, J. Piper and R. Plemmons, *Nonnegative Matrix Factorization for Spectral Data Analysis*, Lin. Alg. and Applic., Vol. 416, No. 1, pp. 29-47, 2006.
- R. Plemmons, *Inverse Problems in Atmospheric Imaging*, in **Computer Mathematics and Applications: Advances and Developments**, Edited by E. Lipitakis, LEA Press, Athens, Greece, pp. 195-204, 2006.
- J. Bardsley, S. Jefferies, J. Nagy and R. Plemmons, *A Computational Method for the Restoration of Images with an Unknown, Spatially-Varying Blur*, Optics Express, Vol. 14, no. 5, pp. 1767-1782, March 2006.
- M. Catral, Lixing Han, Michael Neumann and Robert Plemmons, *On Reduced Rank Nonnegative Matrix Factorization for Summarizing Video Sequences*, Linear Algebra and Applications, Vol. 393, pp. 107-126, 2004.
- P. Pauca, R. Plemmons, S. Prasad and J. van der Gracht, *High-Resolution Imaging Using Integrated Optical Systems*, International Journal on Imaging Systems and Technology, Vol. 14, No. 2, pp. 67-75, 2004 (invited paper).
- S. Prasad, T. Torgersen, P. Pauca, R. Plemmons, and J. van der Gracht, *Engineering the pupil phase to improve image quality*, in Proceedings of the SPIE Vol. 5108 Visual Information Processing XII, edited by Z. Rahman, R. Schowengerdt, and S. Reichenbach (SPIE, Wellingham, WA, 2003), pp. 1-12.
- S. Prasad, T. Torgersen, V. P. Pauca, R. J. Plemmons, and J. van der Gracht, *Restoring Images with Space Variant Blur via Pupil Phase Engineering*, Optics in Information Systems, Special Issue on Computer Imaging, vol. 4, no. 2, pp. 4-13, 2003.

Synergistic Activities

- Author of over 200 papers and 3 books.
- Directed twenty-nine M.S. students and twelve Ph.D. students.
- Society for Industrial and Applied Math (SIAM), served three terms on the Council and two terms on the Board of Trustees.
- SIAM Activity Group Linear Algebra, Founding Vice-Chair, 1982, Chair 1984-86.
- SIAM Activity Group on Imaging Science, Founding Vice-Chair, 1999-2001.
- Member of APS, IEEE, OSA, SIAM and SPIE. Have served on the editorial boards of nine journals.
- Honored as Engineering Educator of the year in 1999 for by the IEEE North Carolina Section for his work in the Wake Forest University Medical Engineering Program.
- Testimony given before the U.S. Senate Committee on Defense Appropriations, and before the U.S. House of Representatives Committee on National Security, 1997-98.
- Continuous research support by DoD and/or NSF grants, 1967-present.