Carl Toews

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Education

University of Virginia, Charlottesville, Virginia.
Ph.D. in Mathematics, August 2002.
M.S. in Mathematics, May 1997.

Universität Osnabrück, Osnabrück, Germany.
Ergänzungsstudium, Systemwissenschaft (Systems Science), Fall 1998.

Claremont McKenna College, Claremont, California.
B.A. in Mathematics (summa cum laude), May 1994.

Experience

Duquesne University, *Assistant Professor* Pittsburgh, PA **2007-present**
Duties include teaching undergraduate and graduate courses, mentoring graduate theses, conducting mathematical research and contributing to the life of the department. Research has included developing algorithms for deterministic compressed sensing, investigating variational and wavelet approaches to image deblurring, optimizing supply chain management schemes, and analyzing isotope dilution algorithms.

IMA, *Research Fellow* Minneapolis, MN **2005-2007**
Conducted research related to the thematic year on mathematical imaging, and served as principal lecturer for the course Linear Algebra and Differential Equations. Research projects included developing novel imaging strategies with wideband radar data, exploiting compressed sensing for manifold learning, and developing a medically applicable technique for position registration via voltage measurements.

MIT Lincoln Laboratory, *Research Staff* Lexington, MA. **2002-2005**
Conducted research and assisted with operations in the space surveillance and imaging divisions. Research included statistical modeling of geosynchronous space debris, exploiting networked GPS data for atmospheric prediction, analyzing the effects of turbulence on radar function, and investigating algorithms to exploit wideband radar images.

University of Virginia, *Graduate Student* Charlottesville, VA. **1995-1997; 1999-2002**
Thesis: "Topological Structures on Spaces of Composition Operators." Analyzed component structures of sets of composition operators acting on Banach spaces of analytic functions. Techniques fused operator theory with analytic function theory.
Teaching: Independently managed all aspects of teaching courses in calculus (all levels) and statistics.

American School of Bilbao, *Teacher* Bilbao, Spain. **1997-1998**
Independently designed and taught courses in 9^{th} and 10^{th} grade math (advanced algebra, precalculus). Also assisted in biology lab and tutored children individually.

Publications

- "Improving the Gauss-Newton convergence of a certain position registration scheme", with Bryan Nelson (submitted)
- "Using the EPQ with partial backordering for coordinated planning of a product and its components," with Dave Pentico and Matt Drake (submitted).
- "Mathematical analysis of speciated isotope dilution mass spectrometry," with J. Kern, H.M. Kingston, M. Rahman, J. Sun and L. Reyes (submitted).
- "Sensitivity analysis for speciated isotope dilution mass spectrometry," with J. Kern, H.M. Kingston, and M. Rahman, *Journal of Analytical Atomic Spectrometry,* DOI 10.1039/b910573e, 2009.
- "The deterministic EPQ with partial backordering: a new approach," with Dave Pentico and Matt Drake, to appear in *Omega*, Vol. 37, no. 3, pp. 624-636, June 2009.
- "Position registration from voltage measurements," co-authored with Fadil Santosa, in *Inverse Problems*, Vol. 23, pg. 2271-2288, 2007.
- "Topological components of composition operators of bounded functions of the ball," in *Integral Equations and Operator Theory*, Vol. 48, no. 2, pp. 265-280, 2004.
- "Statistical analysis of close approach distances in the geostationary environment," co-authored with Eric Phelps, in *Proceedings of the AIAA/AAS Astrodynamics Specialist Conference*, Big Sky, Montana, 2003.

- "Incorporating WAAS data into an ionospheric model for correcting satellite radar observations," co-authored with Anthea Coster, Eric Phelps, Lori Thornton, and Susan Shulman, in *Proceedings of the 16 International Technical Meeting of the Satellite Division of The Institute of Navigation*, Portland, Oregon, 2003.
- "Differences of composition operators," co-authored with Jennifer Moorhouse, AMS Contemporary Mathematics, Vol. 321, *Trends in Banach Spaces and Operator Theory*, pg. 207-213, 2003.

Selected Lincoln Laboratory Reports

- "The effect of atmospheric turbulence on coherent integration," co-authored with Weber Hoen, January 2005.
- "The effect of atmospheric fluctuations on antenna gain," co-authored with Weber Hoen, December 2004.
- "Estimating upper bounds on the probability of collision between objects in the geostationary environment," co-authored with John Conner, April 2004.
- "Statistical analysis of close approaches in the geostationary environment," October 2003.

Conferences and Invited Talks

- Tufts Mathematics Colloquium, Invited Address, March 7, 2009, *Composition Operators on Spaces of Analytic Functions*.
- Colgate Science Colloquium, Invited Address, April 4, 2008, *Position Registration with Voltage Measurements: An Inverse Problem in Medical Imaging*.
- AMS Joint Meetings, San Diego, CA, January 2008, *An application of quaternions to a problem in position registration.*
- International Conference on Applied Inverse Problems, Vancouver, Canada, June 2007, *Position Registration from Voltage Measurements.*
- Institute of Navigation GPS conference, Portland, Oregon, September 2003, *Incorporating WAAS data into an ionospheric model for correcting satellite radar observations.*
- AIAA/AAS Astrodynamics Specialist Conference, Big Sky, Montana, August 2003, *Statistical analysis of close approach distances in the geostationary environment.*
- Young Analysts Meeting of the Southeast, Greenville, South Carolina, July 2003, *Topological components of composition operators on bounded functions of the ball.*
- Great Plains Operator Theory Symposium, Charlotte, North Carolina, May 2002, *Topological components of composition operators on bounded functions of the ball.*
- South Eastern Analysis Meeting, Chapel Hill, North Carolina, March 2002, *Differences of composition operators.*

Languages

Proficient spoken and written German, Spanish, French, and Italian. (Native tongue is English.)

Translations

- *Uno y El Universo*, by Ernesto Sabato. (This is a book-length collection of essays. Selected essays appeared in the literary journal *Calque*, Vol. 3, Nov. 2007. Full manuscript is being circulated.)

Computer Skills

Programming Languages: C, C++
Operating Systems: Linux, Windows, Mac OS X
Other: Latex, (X)HTML, Matlab, R, MySQL

Grants, Awards, and Honors

Faculty Development Fund Grant ($10,000), Duquesne University, 2008-2009
IMA Postdoctoral Fellowship, 2005-2007
Departmental Teaching Award finalist, University of Virginia, Spring 2002
Dissertation Year Fellowship, University of Virginia, Spring 2002
GAANN Grant, University of Virginia, Spring 2002
Pratt Fellowship, University of Virginia, 1999, 2000
Dupont Fellowship, University of Virginia, 1995-1997, 1998-1999
Phi Beta Kappa, Claremont McKenna College, 1994
Undergraduate Summer Research Award, Claremont McKenna College, 1993

Professional Memberships

American Mathematical Society
Society for Industrial and Applied Mathematics

Hobbies

Karate, tennis, guitar, cooking, languages