

THEODORE E. SCHOMAY

Scientific Computing and Imaging (SCI) Institute
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EDUCATION

Institution	Degree	Year	Field
University of Utah	Ph.D.		Bioengineering
University of Utah	M.S.	12/2014	Bioengineering
University of Colorado at Boulder	B.A. <i>summa cum laude</i>	12/2011	Physics
University of Colorado at Boulder	B.A.	12/2011	Mathematics

RESEARCH EXPERIENCE

Graduate Research Assistant, Department of Bioengineering and SCI Institute Graduate Fellow in Computational Systems Biology

University of Utah

8/2012–

Developing mathematical frameworks to comparatively decompose multiple tensors with applications to pattern finding in large-scale genomic datasets, with Dr. Alter.

Biophysics Research Intern, U.S. Air Force Research Lab 711th Human Performance Wing, Bioeffects Directorate Fort Sam Houston, TX

4/2012– 8/2012

Modeled laser-biology interactions:

1. Developed simulation of cellular excitement under exposure to infrared laser radiation.
2. Simulated theoretical data for three experiments: IR induced CHO cell depolarization; THz radiation induced skin tissue damage; and THz radiation induced neuron excitation.

Undergraduate Research Assistant, University of Colorado at Boulder

5/2009– 2/2012

1. Studied, with Dr. Barnes, the background magnetic fields typically found in cell culture incubators. Designed, built and calibrated an induction probe to measure low level, time varying magnetic fields. Collected static and time varying field data from 21 incubators. Field variations large enough to affect cell behavior were found.
2. Studied, with Dr. Wachtel, the possibility of killing pine beetles in newly affected trees without harming the tree using microwave radiation.

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Utah

8/2013–12/2013

Assisted 70 graduate and undergraduate students in a course “Introduction to Statistics for Bioengineers” through weekly office hours and leading class in the instructor’s absence.

Volunteer, Partnerships for Informal Science Education in the Community (PISEC)

University of Colorado at Boulder

1/2010– 5/2010

Taught electronics concepts to underprivileged middle-school students in an after school program. Overall program goal was to develop improved methods of teaching scientific concepts.

Math and Science Tutor, Kauai Community College

1/2007– 5/2007

PUBLICATIONS

1. P. Sankaranarayanan,* **T. E. Schomay**,* K. A. Aiello, and O. Alter, "Tensor GSVD of Patient- and Platform-Matched Tumor and Normal DNA Copy-Number Profiles Uncovers Chromosome Arm-Wide Patterns of Tumor-Exclusive Platform-Consistent Alterations Encoding for Cell Transformation and Predicting Ovarian Cancer Survival," *Public Library of Science (PLoS) One* 10 (4), article e0121396 (April 2015);
<http://dx.doi.org/10.1371/journal.pone.0121396>
Press Release: J. Kiefer, "New Method Increases Accuracy of Ovarian Cancer Prognosis and Diagnosis," *American Association for the Advancement of Science (AAAS) EurekAlert!* (April 15, 2015);
http://www.eurekalert.org/pub_releases/2015-04/uouh-nmi040915.php
2. L. A. Portelli, **T. E. Schomay** and F. S. Barnes, "Inhomogeneous Background Magnetic Fields in Biological Incubators is a Potential Confounder for Experimental Variability and Irreproducibility," *Bioelectromagnetics* 34 (5) pp. 337–348 (July 2013);
<http://dx.doi.org/10.1002/bem.21787>
3. **T. E. Schomay**, *Study of Static and Low Frequency Magnetic Fields in Cell Culture Incubators*. Boulder, CO: University of Colorado Undergraduate Honors Thesis (November 2011).

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1. © P. Sankaranarayanan, **T. E. Schomay**, K. A. Aiello and O. Alter 2015, "Tensor GSVD of Patient- and Platform-Matched Tumor and Normal DNA Copy-Number Profiles Uncovers Chromosome Arm-Wide Patterns of Tumor-Exclusive Platform-Consistent Alterations Encoding for Cell Transformation and Predicting Ovarian Cancer Survival;"
http://www.alterlab.org/OV_prognosis/

PRESENTATIONS

Invited Talks at International Meetings

1. K. A. Aiello, **T. E. Schomay** and O. Alter, "Cancer Diagnostics and Prognostics from Comparative Spectral Decompositions of Patient-Matched Genomic Profiles," *20th International Linear Algebra Society (ILAS) Meeting* (Leuven, Belgium, July 11–15, 2016).
2. **T. E. Schomay**, P. Sankaranarayanan, K. A. Aiello and O. Alter, "Tensor GSVD for Comparison of Two Column-Matched and Row-Independent Large-Scale Biomedical Datasets," *2014 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting* (Chicago, IL, July 7–11, 2014).

Contributed Talks at International Meetings

1. **T. E. Schomay**, K. A. Aiello and O. Alter, "Novel Tensor GSVD Predicting Ovarian Cancer Survival and Response to Platinum-Based Chemotherapy," *2015 Biomedical Engineering Society (BMES) Annual Meeting* (Tampa, FL, October 7–10, 2015).
2. **T. E. Schomay**, P. Sankaranarayanan and O. Alter, "Tensor GSVD for Comparison of Two Column-Matched and Row-Independent Large-Scale Biomedical Datasets," *2013 BMES Annual Meeting* (Seattle, WA, September 25–28, 2013).
3. **T. E. Schomay**, L. A. Portelli and F. S. Barnes, "Study of the Static and Low Frequency Magnetic Fields in Incubators," *33rd Annual Meeting of the Bioelectromagnetics Society* (Halifax, Nova Scotia, Canada, June 12–17, 2011).

Contributed Talks at National Meetings

4. **T. E. Schomay**, H. T. Beier, J. E. Parker, J. D. Musick, I. L. Bennett, C. C. Roth and R. J. Thomas, "Model of Heat Transferred to Cell Culture from IR Laser for Excitation Purposes," *2012 Directed Energy Annual Symposium* (Albuquerque, NM, November 26–30, 2012).

Contributed Posters at International Meetings

1. **T. E. Schomay**, K. A. Aiello and O. Alter, "A Novel Tensor GSVD Predicting Ovarian Serous Cystadenocarcinoma Survival and Response to Platinum-Based Chemotherapy," *National Cancer Institute (NCI) Joint Meeting of the Cancer Systems Biology Consortium and the Physical Sciences in Oncology Network* (Rockville, MD, August 29–31, 2016).
2. **T. E. Schomay**, K. A. Aiello and O. Alter, "The Tensor GSVD: A Comparative Spectral Decomposition for Two Column-Matched and Row-Independent Tensors," *NCI Physical Sciences in Oncology Symposium* (Rockville, MD, February 2–3, 2016).
3. **T. E. Schomay**, K. A. Aiello and O. Alter, "The Tensor GSVD: A Comparative Spectral Decomposition for Two Column-Matched and Row-Independent Tensors," *2016 TDA Workshop* (Leuven, Belgium, January 18–22, 2016).
4. **T. E. Schomay**, K. A. Aiello and O. Alter, "DNA Copy-Number Alterations in Primary Ovarian Serous Cystadenocarcinoma Encoding for Cell Transformation and Predicting Survival and Response to Platinum Therapy Throughout the Course of the Disease," *American Association for Cancer Research (AACR) Advances in Ovarian Cancer Research: Exploiting Vulnerabilities* (Orlando, FL, October 17–20, 2015).
5. **T. E. Schomay**, P. Sankaranarayanan, K. A. Aiello and O. Alter, "Tensor GSVD for Comparison of Two Large-Scale Multidimensional Datasets," *48th Asilomar Conference on Signals, Systems and Computers* (Pacific Grove, CA, November 2–5, 2014).
6. P. Sankaranarayanan, **T. E. Schomay**, K. A. Aiello and O. Alter, "Mathematical Comparisons of Cancer Patient-Matched Genomic Profiles Predict Survival and Drug Targets," *2013 BMES Annual Meeting* (September 25–28, 2013).
7. H. Wachtel, F. S. Barnes, L. A. Portelli and **T. E. Schomay**, "Strategic Application of Power to Zones of Arboreal Perimeters (SAPZAP) to Selectively Destroy Pine Beetles In Situ," *Joint Meeting of the Bioelectromagnetics Society and the European Bioelectromagnetics Association* (Davos, Switzerland, June 14–19, 2009).

AWARDS

- 9/2015, 7/2014, 9/2013 Graduate Student Travel Award, University of Utah Graduate School
- 7/2012– SCI Institute Graduate Fellowship in Computational Systems Biology
- 6/2012–8/2012 ORISE/ORAU Repperger Summer Intern Fellowship
- 4/2012–6/2012 DEPS Summer Intern Fellowship
- 12/2011 B.A. in Physics *summa cum laude*, University of Colorado at Boulder
- 6/2011 3rd Place Student Platform Presentation, Bioelectromagnetics Society
- 6/2011 Student Travel Grant, Bioelectromagnetics Society
- 8/2010–5/2011, 5/2010–8/2010 Undergraduate Research Opportunity Program individual research grant

PROFESSIONAL ACTIVITIES

- 7/2014 Co-Organizer, Session, "Discovery from Data III: Decompositions for Big Data Applications," *2014 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting* (Chicago, IL)

RESEARCH ADVISOR

Orly Alter, USTAR Associate Professor of Bioengineering and Human Genetics, Scientific Computing and Imaging Institute and Huntsman Cancer Institute, University of Utah