

# Theodore (Ted) Schomay

tschomay@gmail.com | 720-300-2460 | www.tschomay.com

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## Personal Statement

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I approach biomedical and engineering problems from a fundamental and rigorous scientific perspective. Currently, I use data science to make discoveries from biomedical data that can inform patient treatment.

- Background in Mathematics, Physics, and Bioengineering
- Faces challenges with creativity
- Talent for troubleshooting
- Enjoys working with others

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## Education

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### University of Utah, Salt Lake City

Ph.D. in Bioengineering

May 2018

M.S. in Bioengineering

Dec. 2014

### University of Colorado, Boulder

B.A. in Physics (*summa cum laude*) and Mathematics

Dec. 2011

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## Data Science Research Experience

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### Graduate Research Assistant

Aug. 2012 – Present

*Genomic Signal Processing Lab, Department of Bioengineering, University of Utah*

Developed mathematical frameworks to comparatively decompose multiple tensors for pattern finding in large-scale genomic datasets. Mathematically defined novel tensor decompositions including proofs of properties and applied these methods to biomedical datasets resulting in new genomic prognostic indicators for cancer.

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## Biophysics Research Experience

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### Biophysics Research Intern

Apr. 2012 – Aug. 2012

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

Simulated interactions between infrared lasers and biological cells following a recent model of cell stimulation induced by change in temperature.

### Undergraduate Research Assistant

May 2009 – Aug. 2009

*Frank Barnes Lab, Department of Electrical Engineering, University of Colorado*

Built and tested an RF exposure system to kill pine beetles *in situ* without harming trees by selectively heating the sap layer to a precise temperature.

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## BioElectroMagnetics Research Experience

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### Undergraduate Research Assistant

Aug. 2009 – Jan. 2012

*Frank Barnes Lab, Department of Electrical Engineering, University of Colorado*

Showed that magnetic field variations in incubators are large enough to affect cell behavior. Designed, built, and calibrated an induction probe for precise measurement of low frequency magnetic fields. Developed protocol to measure static and AC magnetic fields and made readings at 600 locations in incubators.

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## Teaching Experience

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### Robotics Technical Coach

2015

*FIRST (For Inspiration and Recognition of Science and Technology) Lego League*

Coached team of middle school students to design and build a Lego Mindstorms robot for competition.

**Graduate Teaching Assistant** 2013  
*Department of Bioengineering, University of Utah*  
 “Introduction to Statistics for Bioengineers” class of 70 graduate and undergraduate students.

**Volunteer Teaching Assistant** 2010  
*Partnerships for Informal Science Education in the Community (PISEC)*  
 Taught electronics concepts to underprivileged middle school students to test efficacy of new teaching methods.

Skills		
Data Science Survival Analysis Data Fusion	Machine Learning Macintosh/Linux/Windows Mathematica	Python Problem Solving Multi-Linear Algebra

Awards and Honors	
<b>Graduate Fellowship in Computational Systems Biology</b> Scientific Computing and Imaging (SCI) Institute, University of Utah	Aug. 2012 – Present
<b>Repperger Summer Intern Fellowship</b> Oak Ridge Institute for Science and Education (ORISE)	Jun. 2012 – Aug. 2012
<b>Summer Intern Fellowship</b> Directed Energy Professionals Society (DEPS)	Apr. 2012 – Jun. 2012
<b>Summa cum laude</b> University of Colorado Department of Physics	Dec. 2011
<b>3rd place Student Platform Presentation</b> Bioelectromagnetics Society Annual Meeting in Halifax, Nova Scotia, Canada	Jun. 2011

Publications
<b><i>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</i></b> P. Sankaranarayanan*, T. E. Schomay*, K. A. Aiello, & O. Alter – <i>Public Library of Science (PLOS) One</i> 10 (4), 2015
<b><i>Inhomogeneous Background Magnetic Fields in Biological Incubators is a Potential Confounder for Experimental Variability and Irreproducibility</i></b> L. A. Portelli, T. E. Schomay, & F. S. Barnes – <i>Bioelectromagnetics</i> 34 (5), 2013
<b><i>Study of Static and Low Frequency Magnetic Fields in Cell Culture Incubators</i></b> T. E. Schomay – University of Colorado Undergraduate Honors Thesis, 2011

Selected Presentations
<b><i>Cancer Diagnostics and Prognostics from Comparative Spectral Decompositions of Patient-Matched Genomic Profiles</i></b> T. E. Schomay, K. A. Aiello, & O. Alter 20 <sup>th</sup> International Linear Algebra Society (ILAS) Conference (Leuven, Belgium, 2016), invited.
<b><i>Tensor GSVD for Comparison of Two Large-Scale Multidimensional Datasets</i></b> T. E. Schomay, P. Sankaranarayanan, K. A. Aiello, & O. Alter Asilomar Conference on Signals, Systems, and Computers (Pacific Grove, CA, 2014).
<b><i>Model of Heat Transferred to Cell Culture from IR Laser for Excitation Purposes</i></b> T. E. Schomay, H. T. Beier, J. E. Parker, J. D. Musick, I. L. Bennett, C. C. Roth, & R. J. Thomas Directed Energy Annual National Symposium (Albuquerque, NM, 2012).