

**KATHERINE A. AIELLO**

Scientific Computing and Imaging (SCI) Institute  
University of Utah, 72 South Central Campus Drive, Salt Lake City, UT 84112  
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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 Virginia	B.S. with distinction	5/2012	Biomedical Engineering

**RESEARCH EXPERIENCE**

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

7/2012–

Comparing and integrating different types of large-scale cancer genomic data from The Cancer Genome Atlas (TCGA) by using matrix and tensor computations to better understand the biology of brain cancers, with Dr. Alter.

**Undergraduate Research Assistant, Cardiac Biomechanics Group  
University of Virginia**

1/2011– 5/2012

Studied the structural and mechanical remodeling of the left atrium due to atrial fibrillation, with Dr. Holmes:

1. Analyzed structural remodeling by quantifying fibrosis as a percentage of the atrial surface using MR images with late gadolinium enhancement.
2. Studied mechanical remodeling by analyzing the passive pressure-volume relationship of the left atrium to determine chamber and tissue stiffness before and after radio-frequency catheter ablation.

**Undergraduate Capstone Project  
University of Virginia**

9/2011– 5/2012

Designed and developed custom Matlab software to apply hierarchical clustering and support vector machine methods to The Human Protein Atlas to identify novel proteomic biomarkers for glial cells, with Drs. Mandell and Papin.

**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.

**Undergraduate Biomedical Engineering Teaching Fellow  
University of Virginia**

1/2012– 5/2012

Led 20 undergraduates through the engineering design process in a course “Biomedical Engineering Design and Discovery.” The semester-long course resulted in the successful development of a novel screening test for strabismus to be used in elementary schools.

**PUBLICATIONS**

1. **K. A. Aiello** and O. Alter, “Platform-Independent Genome-Wide Pattern of DNA Copy-Number Alterations Predicting Astrocytoma Survival and Response to Treatment Revealed by the GSVD Formulated as a Comparative Spectral Decomposition,” *Public Library of Science (PLoS) One* **11** (10), article e0164546 (October 2016); <http://dx.doi.org/10.1371/journal.pone.0164546>

## PUBLICATIONS (continued)

2. 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](http://www.eurekalert.org/pub_releases/2015-04/uouh-nmi040915.php)
3. **K. A. Aiello**, *Identification of Novel Proteomic Biomarkers for Glial Cells by Data-Mining the Human Protein Atlas*. Charlottesville, VA: University of Virginia B.S. Thesis (2012);  
<http://search.lib.virginia.edu/catalog/u5714817>

## COPYRIGHTED SOFTWARE

1. © **K. A. Aiello** and O. Alter 2016, "Platform-Independent Genome-Wide Pattern of DNA Copy-Number Alterations Predicting Astrocytoma Survival and Response to Treatment Revealed by the GSVD Formulated as a Comparative Spectral Decomposition,"  
[http://www.alterlab.org/astrocytoma\\_prognosis/](http://www.alterlab.org/astrocytoma_prognosis/)
2. © 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/](http://www.alterlab.org/OV_prognosis/)

## PRESENTATIONS AT INTERNATIONAL MEETINGS

### Invited Talks

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. **K. A. Aiello** and O. Alter, "Comparison and Integration of Genomic Profiles Predict Brain Cancer Survival and Drug Targets," *2014 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting* (Chicago, IL, July 7–11, 2014).
3. 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 SIAM Annual Meeting* (Chicago, IL, July 7–11, 2014).

### Contributed Talks

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).

### Contributed Posters

1. **K. A. Aiello** and O. Alter, "Platform-Independent Genome-Wide Pattern of DNA Copy-Number Alterations Predicting Astrocytoma Survival and Response to Treatment Revealed by the GSVD Formulated as a Comparative Spectral Decomposition," *Australian Mathematical Sciences Institute (AMSI) BioInfoSummer 2016* (Adelaide, SA, Australia, November 28 – December 2, 2016), AMSI Best Poster Award.

### Contributed Posters (continued)

2. **K. A. Aiello** and O. Alter, "Platform-Independent Genome-Wide Pattern of DNA Copy-Number Alterations Predicting Astrocytoma Survival and Response to Treatment Revealed by the GSVD Formulated as a Comparative Spectral Decomposition," *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).
3. T. E. Schomay, **K. A. Aiello** and O. Alter, "A Novel Tensor GSVD Predicting Ovarian Serous Cystadenocarcinoma Survival and Response to Platinum-Based Chemotherapy," *NCI Joint Meeting of the Cancer Systems Biology Consortium and the Physical Sciences in Oncology Network* (Rockville, MD, August 29–31, 2016).
4. **K. A. Aiello** and O. Alter, "The GSVD as a Comparative Spectral Decomposition Uncovers DNA Copy-Number Alterations Predicting Astrocytoma Survival," *NCI Physical Sciences in Oncology Symposium* (Rockville, MD, February 2–3, 2016).
5. 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).
6. **K. A. Aiello** and O. Alter, "The GSVD as a Comparative Spectral Decomposition Uncovers DNA Copy-Number Alterations Predicting Astrocytoma Survival," *2016 Tensor Decompositions and Applications (TDA) Workshop* (Leuven, Belgium, January 18–22, 2016).
7. 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).
8. 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).
9. **K. A. Aiello** and O. Alter, "Cross-Platform DNA Copy-Number Alterations Predict Astrocytoma Survival and Response to Chemotherapy," *2015 Biomedical Engineering Society (BMES) Annual Meeting* (Tampa, FL, October 7–10, 2015).
10. **K. A. Aiello** and O. Alter, "Cross-Platform DNA Copy-Number Alterations Predict Astrocytoma Survival and Response to Chemotherapy," *International High-Performance Computing (HPC) Summer School 2015 on HPC Challenges in Computational Sciences* (Toronto, Canada, June 21–26, 2015).
11. **K. A. Aiello** and O. Alter, "Comparison and Integration of Genomic Profiles Predict Brain Cancer Survival and Drug Targets," *48th Asilomar Conference on Signals, Systems and Computers* (Pacific Grove, CA, November 2–5, 2014).
12. 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).
13. **K. A. Aiello** and O. Alter, "Cross-Platform Validation of a Genomic Pattern for the Prognosis and Assessment of GBM Brain Cancer," *2013 BMES Annual Meeting* (September 25–28, 2013).
14. 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).

## **AWARDS**

- 12/2016 Australian Mathematical Sciences Institute (AMSI) Best Poster Award, AMSI BioInfoSummer 2016 (Adelaide, SA, Australia)
- 10/2015 2015 Grace Hopper Celebration Scholar, Invited Participant and Travel Award from the National Science Foundation (Houston, Texas)
- 9/2015, 7/2014, 9/2013 Graduate Student Travel Award, University of Utah Graduate School
- 6/2015 Invited Participant and Travel Awardee, International High-Performance Computing (HPC) Summer School on HPC Challenges in Computational Sciences (Toronto, Canada)
- 4/2013 Invited Participant and Travel Awardee, Computing Research Association (CRA) Graduate Cohort Workshop (Boston, Massachusetts)
- 7/2012– SCI Institute Graduate Fellowship in Computational Systems Biology
- 5/2012 B.S. in Biomedical Engineering with Distinction, University of Virginia
- 12/2011, 5/2011, 5/2010, 5/2009, 12/2008 University of Virginia Dean's List

## **PROFESSIONAL ACTIVITIES**

- 7/2014 Co-Organizer, Session, "Discovery from Data II: Cancer Genomics Signals and Systems," *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