Katherine A. Aiello

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EDUCATION

Doctor of Philosophy, Bioengineering
University of Utah, Salt Lake City, UT — Expected 2017

Master of Science, Bioengineering
University of Utah, Salt Lake City, UT — December 2014

Bachelor of Science, Biomedical Engineering
Minor, Engineering Business
University of Virginia, Charlottesville, VA — May 2012

RESEARCH EXPERIENCE

Genomic Signal Processing Laboratory — July 2012 – Present
University of Utah, Salt Lake City, UT

- Compared and integrated large-scale genomic data from The Cancer Genome Atlas by using matrix and tensor computations to identify fundamental patterns of copy-number aberrations in astrocytoma brain cancer and ovarian cancer.
- Used statistical survival analyses to determine the clinical effectiveness of patterns of copy-number aberrations in predicting patient survival and response to chemotherapy.
- Developed custom code for the analysis and visualization of genomic copy-number data.

Cardiac Biomechanics Group — January 2011 – May 2012
University of Virginia, Charlottesville, VA

- Studied the structural and mechanical remodeling of the left atrium due to atrial fibrillation.
- Analyzed structural remodeling by quantifying fibrosis as a percentage of the atrial surface using MR images with late gadolinium enhancement.
- 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 Thesis Project — September 2011 – May 2012
University of Virginia, Charlottesville, VA

- Used clustering and support vector machine methods to identify novel proteomic biomarkers for glial cells using data from The Human Protein Atlas.
- Designed and developed custom Matlab code for the analysis of large-scale genomic data.

TEACHING EXPERIENCE

Graduate Teaching Assistant August 2013 – December 2013
University of Utah, Salt Lake City, UT Department of Bioengineering

- Assisted 70 graduate and undergraduate students with course material and assignments in weekly office hours for *Introduction to Statistics for Bioengineers.*
- Developed new course material and gave lectures in instructor's absence, including review of previously covered topics and teaching new material.

Undergraduate Teaching Fellow January 2012 – May 2012
University of Virginia, Charlottesville, VA Department of Biomedical Engineering

- Mentored a team of 20 undergraduate students through the engineering design process in *Biomedical Engineering Design and Discovery.*
- The design team successfully developed and implemented a novel screening tests for strabismus.

PUBLICATIONS

1. **K. A. Aiello** and O. Alter, "Tumor-exclusive and platform-independent genome-wide DNA copy-number alterations predicting astrocytoma survival and response to chemotherapy," *Manuscript in preparation.*

2. T. E. Schomay,* **K. A. Aiello** and O. Alter, "Tensor GSVD for Comparative Modeling of Two Column-Matched and Row-Independent Large-Scale High-Dimensional Datasets," *Manuscript in preparation.*

3. S. 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); doi: 10.1371/journal.pone.0121396.

4. **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.

PRESENTATIONS

Invited Talks at International Meetings

1. **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).

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, "Tensor GSVD Predicting Ovarian Cancer Survival and Response to Platinum-Based Chemotherapy," Biomedical Engineering Society (BMES) 2015 Annual Meeting (Tampa, FL, October 7-10, 2015).

Contributed Posters at International Meetings

1. **K. A. Aiello** and O. Alter, "Cross-Platform DNA Copy-Number Alterations Predict Astrocytoma Survival and Response to Chemotherapy," Biomedical Engineering Society (BMES) 2015 Annual Meeting (Tampa, FL, October 7-10, 2015).

2. **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).

3. 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).

4. **K. A. Aiello** and O. Alter, "Cross-Platform Validation of a Genomic Pattern for the Prognosis and Assessment of GBM Brain Cancer," *Biomedical Engineering Society (BMES) 2013 Annual Meeting* (Seattle, WA, September 25–28, 2013).

5. P. Sankaranarayanan, T. E. Schomay, **K. A. Aiello** and O. Alter, "Mathematical Comparisons of Cancer Patient-Matched Genomic Profiles Predict Survival and Drug Targets," *Biomedical Engineering Society (BMES) 2013 Annual Meeting* (Seattle, WA, September 25–28, 2013).

PROFESSIONAL ACTIVITIES

1. Co-Organizer, Session, "Discovery from Data II: Cancer Genomics Signals and Systems," *2014 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting*, (Chicago, IL).

HONORS AND AWARDS

SCI Institute Graduate Fellowship in Computational Systems Biology
Scientific Computing and Imaging Institute
August 2012 – Present

2015 Grace Hopper Celebration Scholar
Grace Hopper Celebration of Women in Computing
Scholarship funded by the National Science Foundation
Houston, Texas
October 2015

International High Performance Computing Summer School Fellow
Extreme Science and Engineering Discovery Environment (XSEDE, NSF-US)
Toronto, Canada
June 2015

2013 CRA-W Graduate Cohort Member
Computing Research Association Committee on the Status of Women in Computing Research
Boston, MA
April 2013

Graduate Student Travel Award
University of Utah Graduate School
September 2013, July 2014, and October 2015

Bachelor of Science in Biomedical Engineering with Distinction
University of Virginia
May 2012

Dean's List
University of Virginia
December 2008, May 2009, May 2010, May 2011, and December 2011

MEMBERSHIPS

Biomedical Engineering Society
Society of Industrial and Applied Mathematics
Women in Engineering Program, University of Utah

COMPUTER SKILLS

Experienced in Matlab, Mathematica, R, Python, C, Java, MPI, and OpenMP.