

Ann Sizemore Blevins

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<https://aesizemore.com>

Education

- Present Ph.D. University of Pennsylvania, Bioengineering
Advisor: Dr. Danielle Bassett
- 2015 M.S.E University of Pennsylvania, Bioengineering
Advisors: Dr. Danielle Bassett, Dr. Chad Giusti
Thesis: "Cliques and cycles: a complementary pair of homological features detects structures in weighted networks weighted networks"
- 2014 B.S. Boston College, Biology
Advisor: Dr. Evan Kantrowitz
Thesis: "Pi-Pi stacking interactions in aspartate transcarbamoylase"
- B.A. Boston College, Mathematics

Articles

Ann Sizemore, Chad Giusti, and Danielle S. Bassett. "Classification of weighted networks through mesoscale homological features." *Journal of Complex Networks* 5.2 (2016): 245-273.

Ann E. Sizemore, Chad Giusti, Ari Kahn, Richard Betzel, Danielle S. Bassett "Cliques and cavities in the human structural connectome." *Journal of computational neuroscience* 44.1 (2018): 115-145.

Ann E. Sizemore and Danielle S. Bassett "Dynamic Graph Metrics: Tutorial, Toolbox, and Tale." *NeuroImage* 180 (2018): 417-427.

Ankit N. Khambhati, **Ann E. Sizemore**, Richard F. Betzel, Danielle S. Bassett "Modelling and Interpreting Network Dynamics." *NeuroImage* 180 (2018): 337-349.

Robin M. Meyers, Jordan G. Bryan, James M. McFarland, Barbara A. Weir, **Ann E. Sizemore**, Han Xu, Neekesh V. Dharia, Phillip G. Montgomery, Glenn S. Cowley, Sasha Pantel, Amy Goodale, Yenarae Lee, Levi D. Ali, Guozhi, Jiang, Rakela Lubonja, William F. Harrington, Matthew Strickland, Ting Wu, Derek C. Hawes, Victor A. Zhivich, Meghan R. Wyatt, Zohra Kalani, Jaime, J. Chang, Michael Okamoto, Todd R. Golub, Jesse S. Boehm, Francisca Vazquez, David E. Root, William C. Hahn, Aviad Tsherniak "Computational correction of copy-number effect improves specificity of CRISPR-Cas9 essentiality screens in cancer cells." *Nature genetics* 49.12 (2017): 1779.

Ann E. Sizemore, Elisabeth A. Karuza, Chad Giusti, Danielle S. Bassett “Knowledge gaps in the early growth of semantic networks.” *Nature human behaviour* 2.9 (2018): 682.

Sydney M Shaffer, Benjamin L Emert, **Ann E. Sizemore**, Rohit Gupte, Eduardo Torre, Danielle S Bassett, Arjun Raj “Memory sequencing reveals heritable single cell gene expression programs associated with distinct cellular behaviors.”

Submitted.

Joshua Pan, Robin M Meyers, Brittany C Michel, Nazar Mashtalir, **Ann E. Sizemore**, Jonathan N Wells, Seth H Cassel, Francisca Vazquez, Barbara A Weir, William C Hahn, Joseph A Marsh, Aviad Tsherniak, Cigall Kadoch “Interrogation of Mammalian Protein Complex Structure, Function, and Membership Using Genome-Scale Fitness Screens.” *Cell systems* 6.5 (2018): 555-568.

Ann E. Sizemore, Jennifer Phillips-Cremens, Robert Ghrist, Danielle S Bassett “The importance of the whole: topological data analysis for the network neuroscientist.” *Network Neuroscience*, Epub Ahead of Print, 2018.

Tanaz Sharifnia, Mathias Wawer, Ting Chen, Qing-Yuan Huang, Barbara A. Weir, **Ann Sizemore**, Matthew A. Lawlor, Amy Goodale, Glenn S. Cowley, Francisca Vazquez, Christopher J. Ott, Joshua M. Francis, Slim Sassi, Patricia Cogswell, Hadley E. Sheppard, Tinghu Zhang, Nathanael S. Gray, Paul A. Clarke, Julian Blagg, Paul Workman, Josh Sommer, Francis Hornicek, David E. Root, William C. Hahn, James E. Bradner, Kwok K. Wong, Paul A. Clemons, Charles Y. Lin, Joanne D. Kotz, and Stuart L. Schreiber “Small-molecule targeting of brachyury transcription factor addiction in chordoma.” Accepted to *Nature Medicine*.

Awards

- 2016 Second place poster in the DBIO section of the American Physical Society March Meeting
- 2014 Balkema Award for top Honors thesis in the Biology Department at Boston College
- 2014 Phi Beta Kappa Membership
- 2014 Pi Mu Epsilon Membership
- 2012 Undergraduate Research Fellowship (through 2014).

Teaching

- 2018 TA for undergraduate class Curiosity: Ancient and Modern Thinking About Thinking
Received TA rating of 4.0 out of 4.0
- 2018 Applied Topology in Neuroscience Seminar (1 semester)

2015 TA for Sophomore-level Biostatistics

Guest Lectures

- 2018 Nov. Curiosity: Ancient and Modern Thinking About Thinking
“Knowledge Gaps.”
- 2017 Sept. Network Neuroscience
“Comparing Networks.”
- 2017 Oct. Differential Equations
“Homogeneous Equations with Constant Coefficients.”
- 2017 Oct. Network Neuroscience
“Persistent Homology.”

Students Advised

- 2018 Undergraduate Melanie Hilman. Topic: Collecting concept maps in the classroom.
- 2017 Summer undergraduate Martin Rubin. Topic: Language of mathematics.
- Fall 2017 – Spring 2018 Undergraduate Pooja Shah. Topic: Graph learning.

Presentations

Invited Talks and Seminars

- 2019 Jan. Joint Mathematics Meeting (Baltimore, Maryland)
“Meaningful Voids: Applying Algebraic Topology to Network Neuroscience.”
- 2018 Dec. Computation and Theory Seminar (Janelia Research Campus)
“Cliques and Cavities in Neuroscience”
- 2018 Oct. Topology in Biology Symposium (University of Pennsylvania)
“Topology in Biological Systems.”
- 2018 Jun. Organization of Human Brain Mapping (Singapore)
“Introduction to applied algebraic topology for the analysis of networks.”
- 2017 Aug. Applied Algebraic Topology 2017 (Hokkaido University)
“Insights into connectome organization using computational topology.”
- 2017 Aug. SIAM Conference on Applied Algebraic Geometry (Georgia Tech. University)
“Connectome organization via persistent homology.”
- 2017 Apr. College of the Holy Cross Mathematics Seminar
“Cliques and cavities in neuroscience.”

- 2017 Feb. Brown University Applied Topology Seminar
“Cliques and cavities in neuroscience.”
- 2016 Dec. Union College Mathematics Conference
“Closures and cavities in the human connectome.”
- 2016 May Experimental Chaos in Complexity (Calgary, Canada)
“Exposing mesoscale connectivity patterns in the structural brain network.””

Public Talks

- 2016 Oct. Broad Institute of Harvard and MIT, Models, Inferences, and Algorithms Primer
“Topological Data Analysis: What is Persistent Homology?”
- 2016 Jun. University of Pennsylvania, Penn Network Visualization Program
“Shapes in the brain.”
- 2015 May American Association of University Women Girls Recognition Reception
“Pursuing Science.”
- 2014 May Boston College Biology Undergraduate Honors Thesis Presentations
“Pi-Pi Stacking interactions in aspartate transcarbamoylase.”

Posters

- 2016 Nov. Society for Neuroscience
“Functional role of topological cycles in the human structural connectome.”
- 2016 Jul. Society for Industrial and Applied Mathematics, Network Science Workshop
“Exposing mesoscale connectivity patterns in the structural brain network.”
- 2016 Mar. American Physical Society
“A novel perspective on neural network architecture: connections and dissections of homological features.”
- 2016 Feb. Computational and Systems Neuroscience
“A novel perspective on neural network architecture: connections and dissections of homological features.”
- 2014 Aug. Summer Scholars Poster Session at the Stowers Institute of Medical Research
“Studying the codiffusion of the secretory complex components through FCCS.”
- 2014 Aug. Boston College Chemistry Undergraduate Research Day.
“The importance of pi-pi stacking interactions in aspartate transcarbamoylase.”

Software Packages

Network Generation and Analysis Toolbox
<https://sites.google.com/a/seas.upenn.edu/weighted-network-toolbox/home>

Dynamic Graph Metrics Toolbox

<https://github.com/asizemore/Dynamic-Graph-Metrics>

Filtered Network Model Reference

<http://filterednetworkmodelref.weebly.com/>