

# ARI E. KAHN

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## EDUCATION

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### University of Pennsylvania

Ph.D. Candidate, Neuroscience

Advisor: Danielle S. Bassett, Ph.D.

Expected Date of Completion: Spring 2020

*2013–Current*  
Philadelphia, PA

### Washington University in St. Louis

B.S. in Computer Science & Chinese

Minor in Physics

Graduated with Engineering Honors, Cum Laude

*2007–2011*  
St. Louis, MO

## RESEARCH EXPERIENCE

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### Tel Aviv University

Research Assistant

Advisor: Matti Mintz, Ph.D.

Computational modeling of the cerebellar microcircuit for sequential learning

*2012*  
Tel Aviv, Israel

### Tel Aviv University

Research Assistant

Advisor: Ehud Gazit, Ph.D.

Implemented and refined a protocol for self-assembling nanospheres

*Winter 2011*  
Tel Aviv, Israel

### Technion University

Research Assistant

Advisor: Nahum Shimkin, Ph.D.

Implemented a machine learning based multilayer flight simulator framework

*Summer 2010*  
Haifa, Israel

### Washington University in St. Louis

Research Assistant

Advisor: William Smart, Ph.D.

Designed framework for BCI-based control of simulated robotic prostheses

*2008–2009*  
St. Louis, MO

## PUBLICATIONS

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Marie-Constance Corsi, Mario Chavez, Denis Schwartz, Nathalie George, Laurent Hugueville, **Ari E. Kahn**, Sophie Dupont, Danielle S. Bassett, and Fabrizio De Vico Fallani (2020). “Functional Disconnection of Associative Cortical Areas Predicts Performance during BCI Training”. In: *NeuroImage*, 116500.

Richard F. Betzel, John D. Medaglia, **Ari E. Kahn**, Jonathan Soffer, Daniel R. Schonhaut, and Danielle S. Bassett (2019). “Inter-Regional ECoG Correlations Predicted by Communication Dynamics, Geometry, and Correlated Gene Expression”. In: *Nature Biomedical Engineering*, In Press.

Elisabeth A. Karuza, **Ari E. Kahn**, and Danielle S. Bassett (2019). “Human Sensitivity to Community Structure Is Robust to Topological Variation”. In: *Complexity* 2019, pp. 1–8.

Ankit N. Khambhati, **Ari E. Kahn**, Julia Costantini, Youssef Ezzyat, Ethan A. Solomon, Robert E. Gross, Barbara C. Jobst, Sameer A. Sheth, Kareem A. Zaghloul, Gregory Worrell, Sarah Seger, Bradley C. Lega, Shennan Weiss, Michael R. Sperling, Richard Gorniak, Sandhitsu R. Das, Joel M. Stein, Daniel S. Rizzuto, Michael J. Kahana, Timothy H. Lucas, Kathryn A. Davis, Joseph I. Tracy, and Danielle S. Bassett (2019). “Functional Control of Electrophysiological Network Architecture Using Direct Neurostimulation in Humans”. In: *Network Neuroscience*, pp. 1–30.

Christopher W. Lynn, Lia Papadopoulos, **Ari E. Kahn**, and Danielle S. Bassett (2019). “Human Information Processing in Complex Networks”. In: arXiv: 1906.00926 [physics, q-bio].

Jennifer Stiso, Ankit N. Khambhati, Tommaso Menara, **Ari E. Kahn**, Joel M. Stein, Sandhitsu R. Das, Richard Gorniak, Joseph Tracy, Brian Litt, Kathryn A. Davis, Fabio Pasqualetti, Timothy H. Lucas, and Danielle S. Bassett (2019). “White Matter Network Architecture Guides Direct Electrical Stimulation through Optimal State Transitions”. In: *Cell Reports* 28.10, 2554–2566.e7.

Steven H. Thompson, **Ari E. Kahn**, Emily B. Falk, Jean M. Vettel, and Danielle S. Bassett (2019). “Functional Brain Network Architecture Supporting the Learning of Social Networks in Humans”. In: arXiv: 1904.09504 [q-bio].

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, and Danielle S. Bassett (2018). “Network Constraints on Learnability of Probabilistic Motor Sequences”. In: *Nature Human Behaviour* 2.12, pp. 936–947. arXiv: 1709.03000.

Jason Z. Kim, Jonathan M. Soffer, **Ari E. Kahn**, Jean M. Vettel, Fabio Pasqualetti, and Danielle S. Bassett (2018). “Role of Graph Architecture in Controlling Dynamical Networks with Applications to Neural Systems”. In: *Nature Physics* 14.1, pp. 91–98.

Christopher W. Lynn, **Ari E. Kahn**, and Danielle S. Bassett (2018). “Structure from Noise: Mental Errors Yield Abstract Representations of Events”. In: *arXiv*. arXiv: 1805.12491.

Ann E. Sizemore, Chad Giusti, **Ari Kahn**, Jean M. Vettel, Richard F. Betzel, and Danielle S. Bassett (2018). “Cliques and Cavities in the Human Connectome”. In: *Journal of Computational Neuroscience* 44.1, pp. 115–145.

Steven H. Thompson, **Ari E. Kahn**, Emily B. Falk, Jean M. Vettel, and Danielle S. Bassett (2018). “Individual Differences in Learning Social and Nonsocial Network Structures”. In: *Journal of Experimental Psychology. Learning, Memory, and Cognition*. pmid: 30024255.

Graham L. Baum, Rastko Ciric, David R. Roalf, Richard F. Betzel, Tyler M. Moore, Russell T. Shinohara, **Ari E. Kahn**, Simon N. Vandekar, Petra E. Rupert, Megan Quarmley, Philip A. Cook, Mark A. Elliott, Kosha Ruparel, Raquel E. Gur, Ruben C. Gur, Danielle S. Bassett, and Theodore D. Satterthwaite (2017). “Modular Segregation of Structural Brain Networks Supports the Development of Executive Function in Youth”. In: *Current Biology* 27.11, 1561–1572.e8. pmid: 28552358.

**Ari E. Kahn**, Marcelo G. Mattar, Jean M. Vettel, Nicholas F. Wymbs, Scott T. Grafton, and Danielle S. Bassett (2017). “Structural Pathways Supporting Swift Acquisition of New Visuomotor Skills”. In: *Cerebral Cortex* 27.1, pp. 173–184.

Elisabeth A. Karuza, **Ari E. Kahn**, Sharon L. Thompson-Schill, and Danielle S. Bassett (2017). “Process Reveals Structure: How a Network Is Traversed Mediates Expectations about Its Architecture”. In: *Scientific Reports* 7.1, p. 12733.

Evelyn Tang, Chad Giusti, Graham L. Baum, Shi Gu, Eli Pollock, **Ari E. Kahn**, David R. Roalf, Tyler M. Moore, Kosha Ruparel, Ruben C. Gur, Raquel E. Gur, Theodore D. Satterthwaite, and Danielle S. Bassett (2017). “Developmental Increases in White Matter Network Controllability Support a Growing Diversity of Brain Dynamics”. In: *Nature Communications* 8.1, p. 1252.

Shi Gu, Fabio Pasqualetti, Matthew Cieslak, Qawi K. Telesford, Alfred B. Yu, **Ari E. Kahn**, John D. Medaglia, Jean M. Vettel, Michael B. Miller, Scott T. Grafton, and Danielle S. Bassett (2015). “Controllability of Structural Brain Networks”. In: *Nature Communications* 6, p. 8414.

## TALKS

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### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. CompleNet. March 4–8, 2018, Boston, Massachusetts, USA.

### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. SIAM Workshop on Network Science. July 12–13, 2018, Portland, Oregon, USA.

## POSTERS

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### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. Interdisciplinary Advances in Statistical Learning. June 27–29, San Sebastian, Spain.

### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. Sackler Colloquium “Brain Produces Mind by Modeling”. May 1–3, 2019, Irvine, California, USA.

### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. MINS Symposium. April 3, 2019, Philadelphia, Pennsylvania, USA.

### **Network Constraints on Learnability of Probabilistic Motor Sequences**

**Ari E. Kahn**, Elisabeth A. Karuza, Jean M. Vettel, Danielle S. Bassett. Conference on Computational Neuroscience. September 5–8, 2018, Philadelphia, Pennsylvania, USA.

### **Beyond graph topology: Walk structure influences cluster-level surprisal effects in an on-line learning task**

Elisabeth A. Karuza, **Ari E. Kahn**, Sharon L. Thompson-Schill, Danielle S. Bassett. Psychonomics. November 17–20, 2016, Boston, Massachusetts, USA.

### **Structural Correlates of Individual Differences in Motor Sequence Learning**

**Ari E. Kahn**, Marcelo G. Mattar, Jean M. Vettel, Nicholas F. Wymbs, Scott T. Grafton, Danielle S. Bassett. Society for Neuroscience. November 12–16, 2016, San Diego, California, USA.

### **A model of sequential learning in the cerebellum**

**Ari E. Kahn**, Ari Magal, Roni Hogri and Matti Mintz. Society for Neuroscience. October 13–17, 2012, New Orleans, Louisiana, USA.

## AWARDS

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<b>Sackler Colloquium “Brain Produces Mind by Modeling” Travel Award</b>	<i>Spring 2019</i>
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<b>SIAM Student Travel Award</b>	<i>Spring 2018</i>
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<b>Jameson-Hurvich Travel Award</b>	<i>Fall 2016</i>
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## TEACHING AND MENTORING

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**Teaching Assistant**

Introduction to Brain and Behavior

*Spring 2016**Led weekly undergraduate recitation section and wrote testing material***Undergraduate Mentoring**

Nathaniel Nyema

*Summer 2018 – Current**Mentoring on behavioral experiments and data analysis***OUTREACH**

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**Upward Bound**

Summer Neuroscience Elective

Head Coordinator

*2016–2018*

Instructor

*2014–2015***Penn Neuroscience Public Lecture Series**

Committee Member

*2014–2017***Neuroscience Elementary School Outreach Program**

Instructor

*2013–2017***PROFESSIONAL AFFILIATIONS**

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Society for Neuroscience

SIAM

**SKILLS**

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**Programming**

Python, R, Matlab, JavaScript, C, C++, LaTeX

**Image Processing**

FSL, ANTs, FreeSurfer, DSI Studio, Nipype