BIOGRAPHICAL SKETCH

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NAME: Brunson, Jason Cory

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eRA COMMONS USER NAME (credential, e.g., agency login): brunsonj

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POSITION TITLE: Research Assistant Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (*if applicable*)	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Virginia Tech, Blacksburg	B.S.	08/2000	05/2004	Mathematics
Virginia Tech, Blacksburg	B.S.	08/2001	08/2004	Statistics
Virginia Tech, Blacksburg	M.S.	08/2004	05/2005	Mathematics
Virginia Tech, Blacksburg	Ph.D.	08/2005	12/2013	Mathematics

A. Personal Statement

I recently completed two postdoctoral fellowships at UConn Health in the Center for Quantitative Medicine, following the completion of my PhD in Mathematics and a brief adjunct professorship. I was first hired in 2014 to train as a data scientist under the supervision of Dr. Reinhard Laubenbacher, and I pursued a variety of projects with different collaborators during this time. These included continuations of my research assistantship work to biomedical settings and original applications of graph theory to modeling biological phenomena. In 2017, I was awarded a training fellowship with the UConn–NIDCR T90/R90 Research Training Program under Dr. Mina Mina. My project focused on network modeling and analysis of administrative healthcare data sets and led to my current focus on topological methods.

My primary research program focuses on predictive modeling and topological modeling toward biomedical problems, in particular using administrative healthcare data sets. The complexity of these data and of the models applied to them conspire to often impede understanding and interpretation, and by exploiting tools from topology—the study of continuity—we are able in some settings to improve both the accuracy of predictions and the clinical value of the model components. This work is in large part a response to my previous efforts to synthesize and evaluate network models of biomedicine, which revealed important limitations the robustness and interpretability of conventional approaches. Nevertheless, i maintain an active research program in network science fueled by collaborations with specialists in biological and clinical domains, including cell biology, immunology, and psychology, as well as other quantitative researchers. Most of my work also involves software development, which has been important to ensuring reproducibility and to enabling experimentation by my own trainees and collaborators as well as other researchers.

My introduction to data science and biomedicine was also my introduction to research mentorship: I supervised four students on a Research Experience for Undergraduates (REU) during my doctoral program, which was perhaps my most rewarding experience as a PhD student. I continued the project in parallel with my dissertation, and since completing my degree I have taken every opportunity to involve students in my research projects. One summer at UConn Health, i mentored two students on several predictive modeling experiments using electronic health record data as part of a related REU. I also initiated participation by the Center for Quantitative Medicine (CQM) in the High School Mentorship Program, through which i mentored four student interns from two area high schools over three summers and helped connect several more to colleagues at CQM. These student trainees participated in study design, data wrangling, software development, and experiments, and have given presentations and coauthored journal articles, software packages, and software tutorials based on their work.