**Tyler Giallanza**

720-224-7737 | Princeton, NJ | tylerg@princeton.edu

**Education\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Ph.D. in Psychology and Neuroscience (Expected 2024)**

Princeton University

**B.S. in Computer Science March 2020**

Southern Methodist University GPA: 4.0

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| **1.** | *Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora.*  Council on Undergraduate Research 2019; invited poster presentation. |

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| **2.** | *Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora.*  Society for Neuroscience Annual Conference 2019; conference presentation. |

* Minor in Chinese

**Study Abroad, Computer Science March 2020**

University of Oxford

**Publications\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

### Conference/Journal Articles

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| **1.** | *Keyboard Snooping from Mobile Phone Arrays with Mixed Convolutional and Recurrent Neural Networks.*  **Tyler Giallanza**, Travis Siems, E. Gabrielsen, I. Johnson, E. Larson, and M. Thornton.  Proceedings of the ACM on Interactive, Mobile, Wearable, and Ubiquitous Technologies. Volume 3 Issue 2, June 2019 Article No. 45. |
| **2.** | *Task Value Calculus: Multi-objective Trade off Analysis using Multiple-Valued Decision Diagrams.*  **Tyler Giallanza**, Eric Gabrielsen, M. Taylor, E. Larson, and M. Thornton.  2019 IEEE 49th International Symposium on Multiple-Valued Logic. Pages 126-131. |

### Open-Source Code Packages

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| **1.** | *ArulesViz: Visualizing Association Rules and Frequent Itemsets.*  Michael Hahsler, **Tyler Giallanza**, and S. Chelluboina.  The Comprehensive R Archive Network (CRAN). |
| **2.** | *ArulesCBA: Classification Based on Association Rules in R.*  Ian Jonhson, **Tyler Giallanza**, and M. Hahsler.  The Comprehensive R Archive Network (CRAN). |
| **3.** | *ArulesCWAR: Classification Based on Weighted Association Rules.*  **Tyler Giallanza** and Michael Hahsler.  The Comprehensive R Archive Network (CRAN). Accepted and in press. |

**Presentations/Lectures**

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| **3.** | *Context-Specific Embedding Spaces Recover Similarity.*  Leadership Alliance National Symposium 2019; conference presentation. |
| **4.** | *Context-Specific Embedding Spaces Recover Similarity.*  Princeton Neuroscience Institute and Intel Labs; invited talk. |
| **5.** | *Task Value Calculus: Multi-objective Trade off Analysis using Multiple-Valued Decision Diagrams.*  Lyle School of Engineering Research Days 2019; poster presentation. |
| **6.** | *Firebase as a Mobile and Web Backend.*  HackSMU 2019; invited workshop presentation. |
| **7.** | *Authentication with Time Delay.*  CSE3339 (Information Security) 2019; invited guest lecture. |
| **8.** | *Scheduling Algorithms for Course-Conflict Reduction at Large Schools.*  Cherry Creek School District Board of Directors Meeting 2017; invited talk. |

### Submitted Publications

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| **1.** | *Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora.*  Marius Cătălin Iordan, **Tyler Giallanza**, C.T. Ellis, N. Beckage, and J.D. Cohen.  Journal submission 2019. Pre-print in arXiv: https://arxiv.org/abs/1910.06954 |
| **2.** | *CWAR: Classification Based on Weighted Association Rules.*  **Tyler Giallanza** and Michael Hahsler.  Journal submission 2019. |
| **3.** | *EAT: Estimated-Arrival-Time Authentication for Encryption-Free Authentication in Resource Constrained Devices.*  **Tyler Giallanza**, Ian Johnson, D. Engels, and J. Dworak.  Conference submission 2019. |

**Service/Teaching\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CyberPatriot Team Mentor August 2018 - Present**

CyberPatriot Cyber Defense Program USA

* Volunteer to mentor 8 high-school teams competing in largest youth cyber defense competition
* Provide tutoring and mentoring weekly via Skype
* Coached 3 teams to score within the top 10% of the competition (out of ~4,000 teams total)

**Co-founder and Lead Instructor Summer 2016 – Winter 2018**

Colorado MC2 Camp Denver, CO

* Co-founded educational summer camp for middle-school students to learn STEM topics
* Lead instructor for multiple weeks per summer; over 75 students instructed since founding
* Developed program website: coloradomc2.com

**Computer Science Tutor August 2016 – May 2017**

Cherry Creek High School Greenwood Village, CO

* Mentored and tutored to at-risk students from under-represented groups
* Instructed 3 students in Advanced Placement Computer Science
* Raised student grades by an average of one and a half letter grades; all tutored students passed the AP test

**Pre-Doctoral Employment\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Research Assistant March 2019 – March 2020**

Neuroscience of Cognitive Control Lab Princeton Neuroscience Institute

* Developed word embedding models for increased predictive power in human behavior
* Employed fMRI scanning to investigate influence of attention on semantic representations
* Awarded funded position by NSF-REU and Leadership Alliance

**Year-Round Research Assistant Fall 2017 – Fall 2019**

Darwin Deason Institute for Cybersecurity Southern Methodist University

* Led research project using deep learning for mobile device side-channel attack prevention
* Headed research project on generative adversarial network applications to network security
* Researched deep learning for audio signal processing
* Designed and implemented graph search algorithms to optimize traversals of multi-valued decision diagrams in multiple-objective optimization problems

**Research Assistant Spring 2017 – Fall 2019**

Intelligent Data Analysis Lab Southern Methodist University

* Interdisciplinary research applying deep learning algorithms to flow field analysis and classification
* Leading research on creating human-interpretable machine learning classification algorithms
* Conducting research on machine learning model understanding through data visualization
* Contributed major feature to open-source R package ArulesViz with over 10,000 unique downloads per month

**Research Assistant Fall 2018 – Spring 2019**

AT&T Center for Virtualization Southern Methodist University

* Creating a data visualization platform to assist corporations comparing CSP offerings
* Deploying big-data search, filtering, and visualization via BigQuery and GCP
* Contributing to open-source platform PerfKitExplorer

**Research Assistant Fall 2017 – Fall 2018**

Lyle School of Engineering Southern Methodist University

* Research and development of novel network security protocols
* Lead author on submitted publication describing low-resource IoT security protocol

**Software Development Intern Summer 2015 & 2016**

Northrop Grumman Aurora, CO

* Led team of students developing computer vision algorithm for object detection from aerial video footage
* Developed content-management website for employee on-boarding and training

**Honors and Awards\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Goldwater Scholar 2019**

Barry Goldwater Scholarship Foundation

* Funded national scholarship award honoring the top undergraduate researchers in STEM fields

**NSF-REU Award Winner 2019**

National Science Foundation

* Fully funded summer research program at the Princeton Neuroscience Institute

**Leadership Alliance SR-EIP 2019**

Leadership Alliance

* Summer research funding and career development (in cooperation with NSF-REU) for URM students

**President’s Scholar 2018**

Southern Methodist University

* 4 year full academic scholarship awarded to top 20 incoming students

**National Merit Scholarship 2018**

National Merit Scholarship Corporation

* $8,000 academic scholarship granted to top students nationally based on test scores

**AXA Achievement Scholar 2018**

AXA Corporation

* $10,000 academic scholarship award granted to top academic achiever and leader in each state

**National AP Scholar 2018**

The College Board

* Award granted to top national AP scorers; awarded due to a perfect 5/5 score on 12 different AP tests

**2nd Place Nationally in Cybersecurity 2017**

CyberPatriot Cyber Defense Program

* Award granted out of thousands of initial teams

**Erdős-Bacon Number = 6**

* Erdős number = 3: Erdős → Noga Alon → Jonathan D Cohen → Tyler Giallanza
* Bacon number = 3: Bacon → Alec Baldwin → Eme Ikwuankor → Tyler Giallanza