

Tyler Giallanza

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Education

B.S. in Computer Science

Southern Methodist University

- Minor in Chinese

August 2017 - June 2020

GPA: 4.0

Study Abroad, Computer Science

Oxford University

October 2019 - June 2020

Employment

Research Assistant

March 2019 - Present

Neurosci. of Cognitive Control Lab, Princeton Neuroscience Institute

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

Year-Round Research Assistant

Fall 2017 - Fall 2019

Darwin Deason Institute for Cybersecurity, Southern Methodist University

- Lead researcher on project using deep learning for mobile device side-channel attack prevention (externally funded)
- Head researcher for project on generative adversarial network applications to network security (externally funded)
- Conducting research on 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

Publications

Conference/Journal Articles

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

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

1. *Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora.*
Council on Undergraduate Research 2019; invited poster presentation.
2. *Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora.*
Society for Neuroscience Annual Conference 2019; conference presentation.
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

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 team mentor for 8 high-school teams competing in largest youth cyber defense competition
- Provides 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

- Worked with head computer science teacher to provide mentoring/tutoring 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

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