Catalina Vajiac

Ph.D. Student · Carnegie Mellon University

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My work focuses on explainable algorithms and interfaces for fighting human trafficking online and is funded by the NSF GRFP.

Education

Carnegie Mellon University	*Pittsburgh, PA*
Ph.D. in Computer Science	*Aug. 2019 - present*
University of Notre Dame	*Notre Dame, IN*
B.S. in Computer Science, **3.87/4.0**	*Aug. 2015 - May. 2019*
Saint Mary's College	*Notre Dame, IN*
B.S. in Computing and Applied Mathematics, **3.91/4.0**	*Aug. 2014 - May. 2018*

Honors and Awards

Mar 2021	**Graduate Research Fellowship**, National Science Foundation	
May 2019	**Outstanding Student Award**, Computer Science Department	*Notre Dame*
Sep 2018	**Anita Borg Scholar**, Grace Hopper Conference	*Houston, Texas*
May 2018	**Donald E. Miller Award**, Mathematics and Computer Science Department	*Saint Mary's College*
May 2018	**Honors on Undergraduate Thesis**, Mathematics and Computer Science Department	*Saint Mary's College*
Jan 2017	**Meritorious Winner**, Mathematical Contest in Modeling	*COMAP*
Jan 2017	**Outstanding Poster Award**, MAA Undergraduate Poster Session	*Joint Math Meetings*
Jan 2017	**Indiana Epsilon Inductee**, Pi Mu Epsilon	*Saint Mary's College*
	Dean's List, All Semesters	*Saint Mary's College*

Publications

Peer-Reviewed: * denotes first author

InfoShield: Generalizable Information-Theoretic Human-Trafficking Detection *2021*
Lee, M.*, **Vajiac, C.***, Kulshrestha, A., Levy, S., Park, N., Jones, C., Faloutsos, C., Rabbany, R. *Chania, Greece*
IEEE International Conference of Data Engineering

Synchronous Hyperedge Replacement Graph Grammars *2018*
Pennycuff, C., Sikdar, S., **Vajiac, C.**, Chiang, D., Weninger, T. *Toulouse, France*
Proc. of International Conference on Graph Transformation.

Developing Colorimetric Comparisons for Paper Analytical Devices *2018*
Vajiac, C.*, Bentley, I. *Atlanta, Georgia*
MAA Undergraduate Poster Session. Won Outstanding Poster Award

Under Review/Not Peer-Reviewed

TrafficLight: Holistic Detection of Human Trafficking in Online Escort Advertisements *2020*
Kulshrestha, A., **Vajiac, C.**, Levy, S., Wang, J., Park, N., Jones, C., Faloutsos, C., Eswaran, D., Lee, M., Rabbany, R.

Exploration of Numerical Precision in Deep Neural Networks *2018*
Li, Z*. Ma, Y*. **Vajiac, C.***, Zhang, Y.*
arXiv preprint arXiv:1805.01078

Undergraduate Research

Synchronous Hyperedge Replacement Graph Grammars *Notre Dame, IN*
Research Assistant   GitHub: tweninger/PSHRG ⌂ *January 2018 — May 2018*

- Extracted features from temporal graphs by learning a CFG from their fragments
- Conducted experiments to evaluate model's performance

Exploration of Numerical Precision in Deep Neural Networks
RESEARCH IN INDUSTRIAL PROJECTS FOR STUDENTS   GITHUB: JIHANGJIE/AMD-RIPS2017

UCLA, California
June 2017 — August 2017

- Studied resiliency of neural networks when exposed to lower numerical precision
- Sponsored by Institute of Pure and Applied Mathematics and by AMD

Exploration of Gradient Descent
UNDERGRADUATE THESIS PROJECT   GITHUB: CATVAJIAC/GRADIENT_DESCENT

Saint Mary's College
August 2017 — December 2017

- Derived equations for gradient descent, forward and back propogation algorithms
- Implemented a multi-layer, fully connected neural network from scratch in Python
- Defended thesis in November 2017, passed with Honors

Computer-Assisted Image Analysis for Paper Analytical Devices (PADs)
RESEARCH ASSISTANT

Saint Mary's College
May 2016 — December 2016

- Created image analysis software to classify chemical reactions in PADs
- Won Outstanding Poster Award at the 2017 Joint Math Meetings

Industry Experience

Business Support Solutions Team, IBM Cloud
SOFTWARE DEVELOPER

IBM, Foster City, CA
June 2018 - August 2018

- Implemented features for Account Management api
- Improved Account Management's workflow for staging and deployment

Outreach

Course Development: Diversity, Equity, and Inclusion in CS and Society
CARNEGIE MELLON UNIVERSITY, COMPUTER SCIENCE DEPARTMENT (CSD)

Pittsburgh, PA
July 2020 — present

- Developed a multi-pronged anti-bias initiative
- Developed course materials as part of a working group
- Successfully pitched mandatory course for first year PhD students in CSD
- Moderated a student group in Spring 2021
- Consulted with many stakeholders at CMU, including DEI office, Eberly Center

Teaching Assistant
SAINT MARY'S COLLEGE AND UNIVERSITY OF NOTRE DAME

Notre Dame, IN
August 2015 — May 2019

- Ran weekly problem sessions for Foundations of Higher Mathematics and Calculus I
- Held office hours and graded for Programming Challenges and Systems Programming

President
MATHEMATICS AND COMPUTER SCIENCE CLUB, SAINT MARY'S COLLEGE

Notre Dame, IN
August 2017 — May 2018

- Organized events and talks to facilitate school-wide interest in mathematics
- Ran cryptography sessions for Hypatia Day (event for middle school girls' exposure to STEM)

Vice–President
LINUX USER'S GROUP OF NOTRE DAME

Notre Dame, IN
August 2018 — May 2019

- Organized and gave weekly talks on topics related to the open-source community

Treasurer
PI MU EPSILON, SAINT MARY'S COLLEGE

Notre Dame, IN
August 2018 — May 2019

- Organized travel for 15 women to go to the Joint Mathematics Meetings 2017 and 2018