

Catalina Vajiac

GRAPH MINING | ANOMALY DETECTION | ANTI-HUMAN TRAFFICKING

PH.D. STUDENT · CARNEGIE MELLON UNIVERSITY

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Education

Carnegie Mellon University

PH.D. IN COMPUTER SCIENCE

Pittsburgh, PA

Aug. 2019 - present

University of Notre Dame

B.S. IN COMPUTER SCIENCE, **3.87/4.0**

Notre Dame, IN

Aug. 2015 - May. 2019

Saint Mary's College

B.S. IN COMPUTING AND APPLIED MATHEMATICS, **3.91/4.0**

Notre Dame, IN

Aug. 2014 - May. 2018

Honors and Awards

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

Atlanta, Georgia

VAJIAC, C.*, BENTLEY, I.

2018

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UNDER REVIEW/NOT PEER-REVIEWED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

Research Projects

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 propagation 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

Anti-Bias Course Development

CARNEGIE MELLON UNIVERSITY

Notre Dame, IN
July 2020 — present

- Developed a multi-pronged anti-bias initiative
- Presented the initiative to the Doctoral Review Committee
- Got departmental approval for a three-session mandatory course for all first-year PhD students in CSD
- Consulted with the following stakeholders at CMU:
DEI office, Eberly (teaching) Center, SCS Dean's PhD advisory committee,
Institutional Research and Analysis office, and Assistant Dean for Educational Experience Assessment
- Currently developing course materials for Spring 2021 pilot

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