Andrew Wintenberg

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Education

The University of Michigan, Ann Arbor - August 2018 - May 2024

- Ph.D. in Electrical Engineering - 2024
- M.S. in Electrical Engineering - 2020
- Advisors: Necmiye Ozay & Stephane Lafortune
- 4.00/4.00 GPA

The University of Tennessee, Knoxville - August 2014 - May 2018

- B.S. in Honors Electrical Engineering
- Double Major in Honors Mathematics
- 3.99/4.00 GPA

Relevant Experience

Postdoctoral Researcher - February 2025 - Present

- Applied Mathematics Department, UCLouvain
- Research on symbolic control of cyber-physical systems

Graduate Student Research Assistant - 2018 - August 2022, January 2023 - May 2024

- Department of Electrical Engineering, The University of Michigan, Ann Arbor
- Research on the privacy and security of discrete event and cyber-physical systems using techniques from formal methods, mentoring several undergraduate students

Graduate Student Instructor- September 2022 - December 2022

Robotics Department, The University of Michigan, Ann Arbor

- ROB 501 - Mathematics for Robotics (Graduate course)
- Lead discussion sections and office hours and occasional lectures

Research Assistant - 2018

- Department of Electrical Engineering, The University of Tennessee, Knoxville.
- Worked under Dr. Seddik Djouadi developing Inertia Emulation controllers for microgrids

Teaching Assistant - 2018

- Assisted Dr. Remus Nicoara in teaching an abstract mathematics course to high school students as part of the Tennessee Governor's School For the Sciences and Engineering
- Lead discussion sections, graded homework, and aided in lectures

Undergraduate Research Assistant - 2016

Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks (CURENT) at The University of Tennessee, Knoxville.

- Researched and developed algorithm for Non-Intrusive Load Monitoring (NILM) and energy disaggregation using dictionary learning and signal-processing techniques
- Participated in summer REU

Undergraduate Research Assistant - 2015 - 2016
Department of Mathematics, The University of Tennessee, Knoxville.

- Independent research project under Dr. Remus Nicoara
- Researched Butson-type Hadamard matrices to develop an algorithm to generate these matrices

Journal Publications

J1 - A. Wintenberg, S. Lafortune, N. Ozay. *Integrating Obfuscation and Control for Privacy.* Under review at IEEE Transactions on Automatic Control 2023.
J2 - A. Wintenberg, S. Lafortune, N. Ozay. *Opacity From Observers With a Bounded Memory.* IEEE Control Systems Letters 2023. Presented at IEEE Conference on Decision and Control 2023.
J3 - A. Wintenberg, M. Blischke, S. Lafortune, N. Ozay. *A General Language-Based Framework for Specifying and Verifying Notions of Opacity.* Journal of Discrete Event Dynamic Systems 2022.
J4 - S. Morovati, Y. Zhang, S. Djouadi, K. Tomsovic, A. Wintenberg, M. Olama. *Robust Output Feedback Control Design for Inertia Emulation by Wind Turbine Generators.* IEEE Transactions on Power Systems 2021.
J5 - S. Mohajerani, R. Malik, A. Wintenberg, S. Lafortune, N. Ozay. *Divergent Stutter Bisimulation Abstraction for Controller Synthesis in Continuous State Spaces*. Automatica 2021.

Conference Publications

C1 - T. Hsu, A. da Costa, A.Wintenberg, B. Bonakdarpour, E. Bartocci. *Gray-box Runtime Enforcement of Hyperproperties.* Under review at 3rd Workshop on Hyperproperties. 2024.
C2 - A. Mainhardt, A. Wintenberg, A. Schmuck, S. Lafortune. *Distributed Attack Synthesis for Discrete Event Systems*. IFAC Workshop on Discrete Event Systems 2024.
C3 - R. Meira-Góes, A. Wintenberg, S. Matsui, S. Lafortune. *MDESops*: *An Open-Source Software Tool for Discrete Event Systems Modeled by Automata*. IFAC World Congress 2023.
C4 - A. Wintenberg, M. Blischke, S. Lafortune, N. Ozay. *A Dynamic Obfuscation Framework for Security and Utility.* ACM/IEEE International Conference Cyber-physical Systems 2022.
C5 - A. Wintenberg, M. Blischke, S. Lafortune, N. Ozay. *Enforcement of K-Step Opacity with Edit Functions.* IEEE Conference on Decision and Control 2021.
C6 - A. Wintenberg, N. Ozay. *Implicit Invariant Sets for High-Dimensional Switched Affine Systems.* IEEE Conference on Decision and Control 2020.

Presentations

A. Wintenberg. *Balancing Privacy and Utility in Networked Systems.* Stephane Fest, August 2023. Slide Presentation.

A. Wintenberg, M. Blischke, S. Lafortune, N. Ozay. *A Dynamic Obfuscation Framework for Privacy and Utility.* IEEE CSS TC DES Virtual Talk Series, July 2022. Slide Presentation.
A. Wintenberg, S. Lafortune, N. Ozay. *Communication Obfuscation for Privacy and Utility against Obfuscation-Aware Eavesdroppers.* American Control Conference, June 2022. Poster Presentation.
A. Wintenberg, A. Rahimpour, H. Qi. *Energy Disaggregation Using Convolutional Sparse Coding.* UTK CURRENT NSF & DOE Site Visit 2016. Poster Presentation.
A. Wintenberg, T. Hobson, J. Massengil, T. Lam, A. McEver. *Tile Sensor.* UTK EECS Senior Design Poster Presentation, May 2017.
A. Wintenberg, Remus Nicoara. *Butson Hadamard Matrices*. UTK Undergraduate Math Conference, April 2018.

Professional Activities

Presented research and assisted in grant preparation which resulted in funding of a research grant from Cisco, 2021.
Served as reviewer for the journals of Nonlinear Analysis: Hybrid Systems and Automatica, IEEE Transactions on Automatic Control, Journal Of Discrete Event Dynamic Systems 2020-2023.
Served as reviewer for the conferences CDC, ECC, L4DC, ICCPS, WODES, 2019-2023.

Awards & Honors

Rackham Predoctoral Fellowship 2023
University of Michigan ECE Departmental Fellowship 2018
Dean's List UTK Summa Cum Laude Fall 2014 - Spring 2018
Recipient of the Goldwater Scholarship 2017
Recipient of the UTK Min H. Kao Scholarship 2015, 2016, 2017
Recipient of the UTK Cooper D. Schmitt Scholarship 2015, 2016, 2017
Recipient of the UTK Dr. Glenn R. and Elise I. Young Scholarship 2017
1st Place 2017 Roborage Robotics Competition (Engineer's Day UTK)
Allen Medal Math Competition UTK 1st Place 2015

Skills

Programming Languages - Python, C, Matlab, Java, Labview, Mathematica, Javascript
Proficiency in microcontroller development - AVR, Atmel Studio, Esp8266
Proficiency in 2D/3D computer graphics and modeling - OpenGL, Blender