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Tzu-Han Hsu



RESEARCH INTERESTS

My research interests include applications of **formal methods** in program **verification**, **synthesis for hyperproperties**, and analysis of **information-flow security**.

EDUCATION

- | | |
|---|--------------|
| Ph.D. Student in Computer Science Engineering
Michigan State University, East Lansing, MI, USA
<i>Advisor: Dr. Borzoo Bonakdarpour</i> | 2020–present |
| Bachelor of Science in Computer Science
Iowa State University, Ames, IA, USA
<i>GPA: 3.86/4.0</i> | 2016–2020 |
| Bachelor of Music in Piano Performance
Iowa State University, Ames, IA, USA
<i>GPA: 3.86/4.0, Outstanding Senior Nomination by the Department of Music</i> | 2013–2017 |

RESEARCH EXPERIENCE

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|---|--------------|
| • Graduate Research Assistant <i>Michigan State University</i>
Formal Methods, Synthesis of Hyperproperties, Information-flow Security, and Privacy | 2020–Present |
| • Undergrad Research Assistant <i>Iowa State University</i>
Model checking and Hyperproperties | 2019–2020 |

CONFERENCE PAPERS

1. [Tzu-Han Hsu](#), Borzoo Bonakdarpour, Eunsuk Kang, and Stavros Tripakis, “**Mapping Synthesis for Hyperproperties**” In *IEEE International Symposium on Computer Security Foundations (CSF’22)*. To appear.
2. [Tzu-Han Hsu](#), César Sánchez, and Borzoo Bonakdarpour, “**Bounded Model Checking for Hyperproperties**” In *International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS’21)*, Luxembourg, Luxembourg.

PREPRINTS

1. [Tzu-Han Hsu](#), Borzoo Bonakdarpour, and César Sánchez, “**HyperQube: A QBF-Based Bounded Model Checker for Hyperproperties**” (2021)
2. [Tzu-Han Hsu](#), Yu Wang, Borzoo Bonakdarpour, Miroslav Pajic, “**Multi-Agent Path Planning with Hyperproperties**” (2020)

TEACHING EXPERIENCE

- **Graduate Teaching Assistant** at Michigan State University Spring 2020
Discrete Structures in Computer Science (CSE 260)
- **Undergrad Teaching Assistant** at Iowa State University Spring 2018, Fall 2018
Object-Oriented Programming (COM S 227)

PROFESSIONAL SERVICE

- **Student Volunteer.** *International Conference on Computer Aided Verification (CAV)*, 2021.
- **Subreviewer.** *International Symposium on Automated Technology for Verification and Analysis (ATVA)*, 2021.

FELLOWSHIPS

- University Graduate Research Fellowship, *Michigan State University*, April 2020.

HONORS, AWARDS, AND SCHOLARSHIPS

- Nomination of Departmental Outstanding Senior of 2020 2020
- Iowa State University College of Liberal Arts and Sciences Dean's List 2013–2020
- Future Leader Award, Issued by U.S. Ambassador to China Terry Branstad 2018
- Iowa State University International Student Ambassador Gold Level Scholarship Recipient 2013–2018
- Iowa State University Music Department Outstanding Student Scholarship Recipient 2013–2018

LEADERSHIP AND VOLUNTEER EXPERIENCES

- The Society for Collegiate Leadership & Achievement 2016–2020
- Iowa State University Student Council, Department Representative 2017–2018
- Iowa Education without Borders (non-profit) Volunteer/Event Coordinator 2017–2018
- Iowa Youth Leadership Summer Camp Student Volunteer 2017–2018
- Iowa State University Annual K-12 Computational Thinking Competition 2020

MUSIC AWARDS

- Soloist Winner, Fort Dodge Orchestra Young Artists Concerto Competition 2015
- 1st Prize Winner, Iowa State University Symphony Orchestra Concerto Competition 2014
- State Winner, Music Teacher National Association (MTNA) Piano Competition 2014

INDUSTRIAL EXPERIENCE

- Software Engineer Intern** 2019–2020
Worrell Medical Design Inc., Minneapolis, MN
- Developed a Virtual Reality Environment on Oculus Quest for Human Factor Engineering usability testing.
 - Programed well-functioning C# scripts in Unity3D engine with desired behaviors and outcomes.
 - Analyzed user feedback and debug/adjust/improve the existing versions of the program with HF engineers.