321-806-5936
abyrnes1@cs.unc.edu
http://www.cs.unc.edu/~abyrnes1

ALYSSA BYRNES

RESUME OBJECTIVE

PhD student in Computer Science looking to gain experience in an industry environment. Looking to use my problem-solving and programming skills to work on a project that I am passionate about.

SPECIAL SKILLS

Programming, Robotics, Formal Methods, Systems, Leadership, Public Speaking, Teaching, Diversity Training

EDUCATION

University of North Carolina — *Ph.D. Computer Science, expected 2021*

Chapel Hill, NC

- Collaborative Sciences Center for Road Safety Scholar.
- Selected courses: Human Robot Interaction, Computer Vision, Robotics, Formal Methods in Security, Algorithm Analysis, Crowd Modeling, Cryptography, Systems Security.
- Summer schools: CPS Summer School 2019, DeepSpec Summer School 2017

Tulane University — *B.S. Mathematics and Computer Science*

2012 - 2016, New Orleans, LA

- 3.7 GPA, Upsilon Pi Epsilon Jim Nolen Award Winner, Honors Student, Recipient of the Distinguished Honors Scholarship.
- Selected courses: Logic In Computer Science, Artificial Intelligence, Algorithms, Information Theory, Computational Geometry, Computer Systems and Networking, Discrete Math, Differential Equations, General Physics, Linear Algebra, Real Analysis, Complex Analysis, Abstract Algebra.

PAPERS

- Evaluating a Specification for its Support of Mode Awareness using Discrete and Continuous Model Checking. **A. Byrnes** and C. Sturton. The 23rd IEEE International Conference on Intelligent Transportation Systems, November 2020.
- On Using a Driver's Eye Data to Predict Accident-Causing Drowsiness Levels. **A. Byrnes** and C. Sturton. The 21st IEEE International Conference on Intelligent Transportation Systems, November 2018.
- A Closed Form Solution Might be Given by a Tree. Valuations of Quadratic Polynomials. **A. Byrnes**, J. Fink, G. Lavigne, I. Nogues, S. Rajasekaran, A. Yuan, L. Almodovar, X. Guan, A. Kesarwani, L. Medina, E. Rowland, V. H. Moll.
- Recursion Rules for the Hypergeometric Zeta Function. **Alyssa Byrnes**, Lin Jiu, Victor H. Moll and Christophe Vignat. International Journal of Number Theory, Jan. 3, 2013.

EXPERIENCE

University of North Carolina — *Research Assistant*

CHAPEL HILL, NC
JUNE 2016 - PRESENT

- Led and conducted user study for measuring driver drowsiness. Analyzed the results to see if eye information can be useful in detecting driver drowsiness. The results were published at The 21st IEEE International Conference on Intelligent Transportation Systems.
- Used model checking to find dangerous instances of mode confusion in an adaptive cruise control system. The results were published at The 23rd IEEE International Conference on Intelligent Transportation Systems.
- Use formal approaches to detect causes of mode confusion in Cyber-Physical Systems.

Distributed Research Experiences for Undergraduates — *Researcher*

COLLEGE STATION, TX
MAY 2015 - JULY 2015

- Worked at Texas A&M University under Jennifer Welch
- Developed/Investigated/Analyzed algorithms that represent relaxed data structures in message-passing systems.
- Developed an algorithm to simulate a k-relaxed Lateness Queue with an improved average lower bound than was previously proposed, then proved the correctness of this algorithm.

Collat Media Lab — *Intern*

NEW ORLEANS, LA
JANUARY 2015 - MAY 2015

- Saw the need for improved educational material in the Computer Science Department at Tulane University, and constructed a proposal for the Collat Media Internship at Tulane.
- Improved the department website, created standardized templates for instructors, and created and enhanced lecture and homework materials.
- The end results were presented at a poster session for the Tulane Center of Engaged Learning and Teaching in April 2015.

Mathematical Sciences Research Institute — *Researcher*

BERKELEY, CA
JUNE 2014 - JULY 2014

- Participated in a two week math intensive.
- Researched and produced a presentation and paper on 2-adic Valuations of Polynomials.

Tulane University — *Researcher*

NEW ORLEANS, LA
JANUARY 2013 - DECEMBER 2013

- Assisted Dr. Christophe Vignat on a paper called Recursion Rules for the Hypergeometric Zeta Function, which was later published in the International Journal of Number Theory.
- Was then invited to work with Dr. Victor Moll in the research of *p*-adic Valuations of Polynomials and Sequences. This research consisted of many findings and finished with a paper and a presentation for peers.

SELECTED POSTER PRESENTATIONS

- Byrnes, Alyssa. “Using Formal Methods to Prove Correctness Properties of a System.” Women in Computing Research Symposium. University of North Carolina. 2018. Poster Presentation.
- Byrnes, Alyssa, Nogues, Isabella, Yuan, Amber. “*p*-adic Valuations of Polynomials.” Presentation-Society for Advancement of Hispanics/Chicanos and Native Americans in Science conference. 2014. Poster Presentation.
    - Won Outstanding Undergraduate Research Presentation
- Byrnes, Alyssa, Nogues, Isabella, Yuan, Amber. “*p*-adic Valuations of Polynomials.” The Joint Mathematics Meetings 2015. Poster Presentation.
    - Won Outstanding Undergraduate Research Presentation
- Byrnes, Alyssa. “An Improved Algorithm for a Relaxed Queue.” Grace Hopper Celebration of Women in Computing. 2015. Poster Presentation.

LEADERSHIP

- *President* of the Computer Science Students Association. University of North Carolina. 2019-2020.
- *Mentor* for three female Ph.D. students. University of North Carolina. 2017-Present.
- *President* of Math Club. Tulane University. 2015-2016.
- *President* of the Computer Science Honors Society, Upsilon Pi Epsilon. Tulane University. 2015-2016.
- *Housing Services Coordinator*. Tulane University. 2014-2016.
- *Resident Advisor*. Tulane University. 2013-2014.

SKILLS

- Programming: Java, C/C++, C#, Python, Matlab, Haskell
- Verification Tools: Coq, Dafny, DReach, Uclid
- Scripting: LaTeX, HTML, CSS, Javascript