Katy Felkner

(405) 808 2703 | felkner@isi.edu | katyfelkner.com

EDUCATION

University of Southern California | Los Angeles, CA
- Ph.D. in Computer Science | Expected 2025 | Supported by **NSF Graduate Research Fellowship**
- Coursework: Advanced Natural Language Processing, Advanced Algorithms, Crafting a Research Agenda in Computer Science, Representation Learning in NLP, Foundations of AI, Fairness in AI | **GPA: 3.88/4.00**

University of Oklahoma | Norman, OK
- B.S. in Computer Science *(summa cum laude)*, B.A. in Letters *(summa cum laude)* | May 2020
- Minor: Mathematics | **GPA: 4.00/4.00**

RESEARCH INTERESTS

machine translation, low-resource NLP, NLP for social good, fairness and bias in large language models (LLMs), ethical AI

PUBLICATIONS

- **Virginia K. Felkner**, Ho-Chun Herbert Chang, Eugene Jang, Jonathan May**.** *Towards WinoQueer: Developing a Benchmark for Anti-Queer Bias in Large Language Models.* QueerInAI Affinity Group Workshop, NAACL 2022.
- Nicolaas Weideman, **Virginia K. Felkner**, Wei-Cheng Wu, Jonathan May, Christophe Hauser, Luis Garcia. *PERFUME: Programmatic Extraction and Refinement For Usability of Mathematical Expressions*. CheckMATE, ACM CCS 2021.
- **Virginia K. Felkner** and Elisabeth Moore. *Investigating the Efficacy of Unstructured Text Analysis for Node Failure Detection in Syslog.* Second Workshop on Machine Learning for Computing Systems, Supercomputing 2020.
- **Virginia K. Felkner.** A Brief History of QED. *The Honors Undergraduate Research Journal* 16th edition. 2017.

RESEARCH EXPERIENCE

Border Translation Project, USC Information Sciences Institute – Graduate Research Assistant AUGUST 2020 – PRESENT
- Build and evaluate neural machine translation systems for extremely low-resource languages
- Improve domain adaptation of NMT systems from news domain to asylum testimonials via backtranslation of English data
- Develop corpus augmentation techniques for languages with very little parallel or monolingual data available
- Currently working on NMT system for K'iche', a Mayan indigenous language, with the intended application of helping nonprofits provide legal assistance to immigrants and asylum seekers.
- Advisor/PI: Jonathan May

NLP Fairness and Bias, USC Information Sciences Institute – Graduate Research Assistant JANUARY 2022 – PRESENT
- Design a novel benchmark dataset for detecting homophobic and transphobic bias in LLMs
- Develop finetuning methods to mitigate anti-LGBTQ+ bias in LLMs
- Work started as a class project for DSCI 531: Fairness in AI and continued under fellowship funding

DARPA ReMATH, USC Information Sciences Institute – Graduate Research Assistant JANUARY 2021 – JUNE 2022
- Built and evaluated NMT models for extraction of symbolic math from assembly code and bit-vector expressions
- Developed novel metrics for evaluation of NMT-generated mathematical expressions
- PI: Luis Garcia

Los Alamos National Laboratory, Ultrascale Systems Research Center — Research Intern MAY 2020 – AUGUST 2020
- Collected 750,000 lines of non-secret syslog data using a 20-node virtual compute cluster
- Tested a variety of word embedding and clustering algorithms to extract natural language features from supercomputer syslog
- Showed that these natural language features are not sufficient on their own but can be used to augment other models for HPC node failure detection and prediction
- Mentor: Elisabeth Moore

Digital Latin Library —Undergraduate Research Assistant JAN. 2017 – MAY 2020
- Wrote Python scripts to parse HTML documents containing Latin texts, generating 125000 lines of SQL output
- Designed scripts to automate XML encoding of Latin prose and poetry, reducing time to encode by a factor of 400
- Designed encoding script for Servius, a text with a uniquely complicated parallel structure.
- Only undergraduate student accepted to National Endowment for the Humanities Institute on Advanced Topics in Digital Humanities for Summer 2018 at Tufts University
- Advisor: Samuel Huskey

PRESENTATIONS

International
- *Servius: An Object-Oriented Approach,* SunoikisisDC, May 2019 (invited talk)

National
- *Automatically Encoding Digital Editions of Latin Texts,* Society for Classical Studies, January 2019
- *Coding And/As Classical Scholarship*, Classical Association of the Midwest and South Conference, April 2018
- *Coding And/As Classical Scholarship,* National Conference on Undergraduate Research, April 2018

WORK EXPERIENCE

Epic Systems Corporation — Software Developer Intern MAY 2019 – AUGUST 2019
- Prototyped a menstrual cycle tracking feature within MyChart for iOS to allow patients to share cycle data with providers
- Designed and implemented server and client side data structures to save cycle data to the patient's medical record
- Built four complete and interactive user-interface screens and partial prototypes of several others
- Conducted user research, including about 100 internal survey responses and 5 user interviews

OU Athletic Department, Norman, OK — Math Tutor SEPTEMBER 2016 – MAY 2017
- Tutored 20 student-athletes in college algebra, precalculus, and business calculus with a higher pass rate than any other tutor
- Selected Athletic Department Tutor of the Month for December 2016

LEADERSHIP

Queers in Engineering, Science and Technology (QuEST) — Graduate Representative SEP. 2020 – PRESENT
- Recruit graduate students to QuEST and advocate for their needs in the organization
- Develop workshops on graduate school and fellowship applications and mentor undergraduate members during applications
- Serve as Ambassador to Viterbi Graduate Student Association
- 2022 oSTEM Region F Conference organizer: presented graduate application workshop, spoke on Queer in Academia panel, wrote and hosted charity Dungeons & Dragons livestream, raising $950 for LGBTQ community organizations in LA

Alpha Sigma Kappa - Women in Technical Studies — President APR. 2019 – APR. 2020, **Vice President** DEC. 2017 – DEC. 2018, **Scholarship Chair** DEC 2016 – DEC 2017
- As Scholarship Chair, ran chapter study hour program and planned professional development workshops
- As VP, planned and executed nine recruitment events per semester, recruiting 32 new members
- As VP, mentored 9 officers on 5 committees, resulting in successful chapter social and new member education programs
- As President, oversaw 6 executive board members and served as chief risk management officer
- As President, led chapter's transition to virtual operations due to COVID-19, rapidly instituting new initiatives to maintain sisterhood and encourage academic excellence during the pandemic

Out in Science, Technology, Engineering, and Math – Secretary MAR. 2017 – DEC. 2019
- Served on founding executive board of first oSTEM chapter in the state of Oklahoma
- Planned and executed about two medium-scale events per month and manage event promotion and member communication

Halliburton Women's Welcome – Lead Mentor AUG. 2017, **Program Committee Chair** AUG. 2018, AUG. 2019
- Planned and executed a weeklong program for 80+ incoming female students in engineering
- Organized campus resource fair and inclusive professional dress workshop that received 91% positive participant feedback
- As a lead mentor, served as a mentor to a small group of eight incoming female engineers

SERVICE

The Carpentries –Carpentries Instructor JAN. 2019 – PRESENT, **Data Carpentry Lesson Maintainer** JUL. 2020 – PRESENT
- Teach Python, R, and SQL as part of free Software Carpentry and Data Carpentry workshops
- Present computer science concepts in an accessible manner to learners with varying degrees of programming experience
- Maintain curriculum for Data Carpentry – Ecology SQL lesson (used internationally in hundreds of workshops annually) by approving pull requests, addressing user issues, and updating curriculum

Teach for Los Angeles – Math Tutor AUG. 2020 – PRESENT
- Meet weekly to provide personalized math tutoring to sixth grade student in low-income school

Boren Mentoring Initiative – Mentor OCT. 2018 – MAY 2019
- Met weekly with a middle school student to work on emotional skills, which teachers observed improving over the year

Engineers Serving Others – Project Leader SEP. 2017 – DEC. 2017
- Led a group of five engineers to research and recommend a volunteer management system for Meals on Wheels Norman

Girl Scout Badge University – Robotics Session Chair NOV. 2018
- Facilitated a robotics workshop for about 20 high school girls using Lego FIRST robotics kits

Girls Learning and Applying Math and Science – Computer Science Session Co-Chair OCT. 2017, FEB. 2018
- Facilitated a craft activity to teach about 60 middle school girls about the basics of ASCII text encoding

HONORS AND AWARDS

National Science Foundation Graduate Research Fellowship	Viterbi Graduate School Fellowship
Gallogly College of Engineering Outstanding Senior	Outstanding Senior in Computer Science
Alpha Sigma Kappa National Outstanding Leader	Outstanding Greek Senior
Letzeiser Honor List – Silver Medalist	OU Campus Life Award (40 outstanding upperclassmen)
Regents' Award for Outstanding Juniors	Mary Enod Williams Classics and Letters Scholarship
Rita H. Lottinville Prize (5 outstanding sophomores)	President's Award for Outstanding Sophomores
Ronald Lehr Phi Beta Kappa Undergraduate Research Award	CAMWS Award for Outstanding Accomplishment in Classical Studies
Engineering Diversity and Inclusion Scholarship	Doug and Hilda Bourne Women in Engineering Scholarship
Women in Engineering Outstanding Sophomore	OU Women in Engineering Impact in Engineering Award
University College PACE Award	Myrna L. Carney Award (3 outstanding freshmen)
Phi Beta Kappa Honor Society	Tau Beta Pi (National Engineering Honor Society)
Phi Kappa Phi Honor Society	Eta Sigma Phi (National Classics Honor Society)