

# Katy Felkner

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## EDUCATION

**University of Southern California** | Los Angeles, CA

- Ph.D. in Computer Science | Expected 2025 | Supported by **Viterbi Graduate School Fellowship**
- Coursework: Advanced Natural Language Processing, Advanced Algorithms

**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

Natural language processing, neural machine translation, NMT for low-resource languages, NLP for social good

## RESEARCH EXPERIENCE

**USC Information Sciences Institute, Natural Language Group – Graduate Research Assistant** AUGUST 2020 – PRESENT

- Build and evaluate neural machine translation systems for extremely low-resource languages
- Develop corpus augmentation techniques for languages with very little parallel or monolingual data available
- Currently working on NMT system for Mixtec, a Mexican indigenous language, with intended application of helping NGOs provide legal assistance to immigrants and asylum seekers. This work will be extended to Kanjobal, Mam, and Kiche.
- Advisor: Jonathan May

**Los Alamos National Laboratory, Ultrascale Systems Research Center — Research Intern** MAY 2020 – AUGUST 2020

- Collected 750000 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

**OU IDEA Lab — Honors Research Assistant** DEC. 2018 – MAY 2020

- Developed a task for drone programming competitions to familiarize high school students with computer vision technology
- Tested various hardware configurations and drones
- Built a Brown PiDrone and analyzed the viability of the build for middle and high school students
- Advisor: Amy McGovern

## PUBLICATIONS

- Felkner, Virginia K. and Elisabeth Moore. Investigating the Efficacy of Unstructured Text Analysis for Node Failure Detection in Syslog. *Second Workshop on Machine Learning for Computing Systems*. November 2020.
- Felkner, Virginia K. A Brief History of QED. *The Honors Undergraduate Research Journal* 16<sup>th</sup> edition. 2017.

## 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

### Local

- *Servius: An Object-Oriented Approach*, OU Undergraduate Research Day, April 2019 (overall highest scoring presentation)
- *Teaching Computer Vision Using Drones*, OU Undergraduate Research Day, April 2019
- *Servius: An Object-Oriented Approach*, OU Libraries Research Bazaar, October 2018
- *Coding And/As Classical Scholarship*, OU Libraries Research Bazaar, October 2017

## WORK EXPERIENCE

**Epic Systems Corporation — Software Developer Intern** MAY 2019 – AUG. 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 SEP. 2016 – MAY 2017**

- Tutored college algebra, precalculus, and business calculus
- Taught a total of 20 students 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

**Queers Graduate Alliance — Executive Board Member OCT. 2020 – PRESENT**

- Plan and execute programming to build community among queer graduate students across USC

**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
- Plan and execute 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

**Jerry Holmes Leadership Program – Holmes Leadership Associate SEP. 2017 – MAY 2020**

- Successfully completed all requirements for HLA program, including biweekly meetings with a professional mentor
- Served on JHLP Student Advisory Board. Co-chaired spring welcome back event and assisted with other meetings

**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**

Viterbi Graduate School Fellowship	Outstanding Senior in Computer Science
Letzeiser Honor List – Silver Medalist	Alpha Sigma Kappa National Outstanding Leader
Gallogly College of Engineering Outstanding Senior	Outstanding Greek Senior
Regents' Award for Outstanding Juniors	Big Woman on Campus (40 outstanding upperclassmen)
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	Mary Enod Williams Classics and Letters Scholarship
Women in Engineering Outstanding Sophomore	Women in Engineering Impact in Engineering Award
University College PACE Award	Doug and Hilda Bourne Women in Engineering Scholarship
National Merit Scholar	Myrna L. Carney Award (3 outstanding freshmen)
Phi Beta Kappa Honor Society	Tau Beta Pi (National Engineering Honor Society)
Eta Sigma Phi (National Classics Honor Society)	Phi Kappa Phi Honor Society