Kenneth Lee

CONTACT INFORMATION

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RESEARCH INTERESTS

Causal inference, machine learning

EDUCATION

Purdue University

Ph.D. in Electrical and Computer Engineering 2021 - 2026
Advisor: Murat Kocaoglu

University of California, Davis

M.S. in Statistics 2019 - 2021
Advisor: Norm Matloff, James Sharpnack

Brigham Young University—Hawaii

B.S. in Mathematics, Computer Science 2014 - 2018

RESEARCH EXPERIENCE

Purdue University Causal Machine Learning Lab
Lab member Aug 2021 - Present

- *Causal Machine Learning:* Researching on where causal inference and discovery could benefit the current machine learning methods.
- Supervisor: Murat Kocaoglu

Purdue University Superpower Group
Research Assistant Aug 2021 - Jun 2022

- *Power Analysis:* Developed new methods for power analysis, utilizing data simulation and innovations in generalizability theory, guided-walk, and machine learning techniques. [**Link to project**].
- Supervisor: Erin Hennes, Sean Lane

University of California, Davis
Researcher Oct 2020 - May 2021

- *Machine Learning:* Researching on an alternative to a probability calibration method named Platt scaling [**Link to project**].
- *Data Science:* Researching on an alternative to resampling techniques in dealing with unbalanced class data.
- Supervisor: Norm Matloff

Carnegie Mellon University, Delphi Epi-Forecasting Group
Researcher Sep 2020 - Feb 2021

- *Causal Inference:* Studied the impact of government interventions on mobility under confounders in US using Delphi EpiData API. [**Link to project**].
- Presented the work at 2020 NSF Student Conference on COVID19 Modelling.
- Advisor: James Sharpnack, Larry Wasserman, Valerie Ventura

Brigham Young University—Hawaii Institutional Research
Research Analyst Intern Aug 2018 - Jun 2019

- *Consulting:* Leveraged 11-year data from enrollment, degree completion, freshman cohort, and curriculum to conduct retention study for BYU—Hawaii President's council.
- *Data Visualization:* Built pipelines to update Tableau Server workbooks automatically from Quartics surveys.
- *Database Management:* Coordinated with the Enterprise Information System department at BYUH to establish a data warehouse to facilitate institutional research.
- *Data Cleaning:* Trained and supervised students workers on the data cleaning and visualization with R and Tableau.
- Status: Part-Time
- Working hours: 27 hours per week
- Supervisor: Kathy Pulotu

Research Assistant Supervisor Sept 2017 - Jun 2018

- *Literature reviews:* Conducted literature reviews for designing new graduating student survey.
- *Data Visualization:* Built a data dashboard from cleaning course evaluation survey data of the past 5 years in R to visualizing the data via Tableau for the school administration and faculty.
- *Statistical Analysis:* Evaluated the redundancy of the graduating student survey questions by using factor analysis.
- *Survey Design:* Led a poster publication titled *"How Meaningful Is Our Graduating Student Survey"* to showcase how to better evaluate survey design.
- Status: Part-Time
- Working hours: 19 hours per week
- Supervisor: Kathy Pulotu

Brigham Young University IDeA Labs

Researcher Intern Jun 2017 - Aug 2017

- *Systems Theory:* Research in Systems and Control Theory with applications in a variety of areas including social networks, natural language processing, and biological systems.
- *Software Engineering:* Tasks involve developing code, modeling networks, analyzing simulations, developing theoretical results and writing research papers.
- Advisor: Sean Warnick
- Status: Full-Time
- Working hours: 40 hours per week

Projects

Understanding the resting behaviors of Trirectangular Tetrahedral and Triangular Prism Dice Rolls

- *Computer Vision:* Applied Faster Regional-Convolutional Neural Networks (R-CNN) in Python to count dice rolls more efficiently by object detection.
- *Robotics:* Configured a dice rolling machine from scratch to automate the process of dice rolling and reduce bias that may come from rolling dice by hand.
- *Software Engineering:* Rewrote codes from MATLAB image processing toolbox to Python using OpenCV, scikit-image and dlib libraries.
- The project got turned into a paper in 2020. [**Link to paper**]
- Duration: 2017- 2019

- Number of hours per week of effort: 3
- Advisor: Paul Hurst

Predict Patient Inflow at Pali Momi Hospital's Emergency Room

- *Machine Learning:* Applied quantile regression model to predict patient inflow at Pali Momi Hospital's Emergency Room (ER).
- *Consulting:* Provided recommendations for how to optimize scheduling for their ER's doctors and mid-level providers.
- Duration: Apr-Jun 2018
- Number of hours per week of effort: 2
- Advisor: Cody Baldwin

Professional Experience

Bayer
Data Scientist Intern — Aug 2022 - Dec 2022

- *Causal Modeling:* Modeled the heterogenous treatment effects of various environmental factors and human practices to crop emergence with EconML and doWhy python packages.
- Status: Part-Time
- Working hours: 20 hours per week

Experian DataLabs
Data Scientist Intern — May 2022 - Aug 2022

- *On-chain Analysis:* Analyzed on-chain credit risks in cryptocurrency exchange and defi systems.
- Status: Full-Time
- Working hours: 40 hours per week

Newday Impact Investing
Data Analytics Intern — Jun 2020 - Aug 2020

- *Machine Learning:* Selected companies from S&P 500 that account for the variance of stock price based on principal component analysis to aid decisions making on portfolio construction with back-testing.
- Status: Part-Time
- Working hours: 20 hours per week

Dell EMC
Associate Consultant Intern — Jun 2019 - Sep 2019

- *System Testing:* Designed and implemented test cases using MS SQL Server for the human resources manpower information system of Hong Kong Vocational Training Council.
- Status: Full-Time
- Working hours: 40 hours per week

Teaching Experience

University of California—Davis
Teaching Assistant — Sep 2019 - Mar 2021

- Graduate Level
  - BAX 422 Data Design and Representation (Winter 2021)
  - BAX 441 Statistical Exploration and Reasoning (Fall 2020)
  - BAX 400 Foundation of Business Analytics (Summer 2020)

- BAX 463 Practicum Analysis & Implementation (Spring 2020)

- Undergraduate Level
  - Statistics Bootcamp on R (Summer 2020)
  - 12Y Data Visualization for Social Sciences (Fall 2019, Winter 2020)

Brigham Young University—Hawaii
Computer Science Substitute Instructor 2017
- CS301: Algorithms and Complexity.

Math Lab Tutor (Calculus) 2015 - 2016

Publications

Journals

[J1] Reinhart, Alex, et al. *An open repository of real-time COVID-19 indicators.* Proceedings of the National Academy of Sciences 118.51 (2021). *Citations: 22*

Conference Proceedings

[C2] **K. Lee**, M. Rahman, and M. Kocaoglu, *Finding Invariant Predictors Efficiently via Causal Structure*, The Conference on Uncertainty in Artificial Intelligence, Pittsburgh, PA, 2023.

[C1] V. Chetty, N. Woodbury, J. Brewer, **K. Lee** and S. Warnick, *Applying a Passive Network Reconstruction Technique to Twitter Data in Order to Identify Trend Setters*, IEEE Conference on Control Technology and Applications, Kohala Coast, HI, 2017.

Posters

[P3] **K. Lee**, S. Fuluvaka, *Meet Don, the Autonomous Dice Rolling Machine*, Brigham Young University-Hawaii Undergraduate Research Conference, 2018.

[P2] **K. Lee**, K. Pulotu, *Graduating Student Survey Revision: A student effort*, California Association for Institutional Research, Garden Grove, CA, 2018.

[P1] K. Pulotu, **K. Lee**, T. Vallabh, Hong Ni M. and R. Ram, *How Meaningful is our Graduating Student Survey?*, Academic Resource Conference, Burlingame, CA, 2018.

Presentations

NSF Student Conference on COVID19 Modelling Jan 2021

Selected Honors

Brigham Young University—Hawaii

Computer and Information Science Overall Outstanding Graduate **(Top 1 of the graduating class)**	2018
Undergraduate Research Best Oral Presentation Award **(1 out of 30 peer research teams)**	2018
Computer Science Alumni Scholarship **(Nominated by faculty)**	2017 - 2018
Mathematics Departmental Scholarship **(Nominated by faculty)**	2014 - 2018
Academic Merit Scholarship **(Top 5% of the school)**	2014 - 2018
University Dean's List **(Top 5% of the school)**	2014 - 2018
Hong Kong Student Association Leadership Certificate	2015 - 2016
BYUH Student Leadership Award	2015

Association for Computing Machinery

ACM/UPE Scholarship Award **(4 out of all the ACM student members)**	2017
Honorable Mention - International Collegiate Programming Contest (Pacific Northwest Region)	2016

The National Society of Leadership and Success

Academic Excellence Scholarship **(12 out of all the NSLS inducted members)**	2017

The Honor Society of Phi Kappa Phi

Love of Learning Award	2019

Association for Uncertainty in Artificial Intelligence

UAI Scholarship	2023

Professional Affiliations

Eta Kappa Nu, Member	2021 - Present
The National Society of Leadership and Success, Member	2017 - Present
Phi Kappa Phi, Member	2016 - Present
Association of Computing Machinery, Member	2016 - Present
Upsilon Pi Epsilon, Member	2016 - Present

Certifications

Deep Learning Specialization, deeplearning.ai	Jun 2019
Machine Learning by Stanford University, Coursera	Mar 2019
Tableau Desktop Specialist, Tableau Software	Feb 2019

Skills

Language: English (Fluent), Cantonese (Native), Mandarin (Fluent)
Programming Language: Python, R, MATLAB, SQL
Framework: , Pytorch, Keras, OpenCV, Scikit-learn, TensorFlow, Dlib
Other: Tableau, AWS EC2, AWS Dynamodb, AWS S3

References

- Academia:
  - **Dr. Norm Matloff**, Professor, UC Davis
    - Field of study: Probability, Functional Analysis and Statistics
    - Relationship: Project advisor
    - Phone: 530-752-1953, Email: `matloff@cs.ucdavis.edu`
  - **Dr. James Sharpnack**, Assistant Professor, UC Davis
    - Field of study: Statistics, Machine Learning
    - Relationship: Project advisor, a teacher in multiple classes
    - Phone: 530-341-3981, Email: `jsharpna@ucdavis.edu`

  - **Dr. Vasu Chetty**, Principal Data Scientist, Lucid Software Inc.,
    * Field of study: Computer Science
    * Relationship: Thesis advisor, a teacher in multiple classes
    * Phone: 808-589-9586, Email: `vasuc@lucidchart.com`
  - **Dr. Sean Warnick**, Professor, Brigham Young University,
    * Field of study: Network Systems and Control
    * Relationship: Summer research internship supervisor
    * Phone: 801-422-6463, Email: `sean@cs.byu.edu`
  - **Dr. Paul Hurst**, Associate Professor, Brigham Young University—Hawaii,
    * Field of study: Mathematics
    * Relationship: Research advisor, a teacher in multiple classes
    * Phone: 808-675-3802, Email: `hurstp@byuh.edu`
  - **Dr. Joel Helms**, Professor, Brigham Young University—Hawaii,
    * Field of study: Mathematics
    * Relationship: A teacher in multiple classes
    * Phone: 808-675-4704, Email: `joel.helms@byuh.edu`
- Employment:
  - **Ms. Kathy Pulotu**, Institutional Research and Assessment Manager, Brigham Young University—Hawaii,
    * Relationship: Direct supervisor
    * Email: `kathy.pulotu@byuh.edu`
  - **Dr. Rose Ram**, Associate Academic Vice President Curriculum and Assessment, Brigham Young University—Hawaii,
    * Relationship: Indirect supervisor
    * Email: `rose.ram@byuh.edu`