

# Xiaohan Kang

SOFTWARE ENGINEER · MACHINE LEARNING RESEARCHER

1619 Delaware St, Berkeley, CA 94703

☎ (+1) 515-509-6693 | ✉ xiaohan.kang1@gmail.com | 🏠 veggente.github.io | 📷 Veggente | 🌐 xiaohankang | 📧 Xiaohan Kang

## Work Experience

### University of Illinois at Urbana-Champaign

Urbana, IL

POSTDOCTORAL RESEARCH ASSOCIATE, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Mar. 2016–present

- Developed CausNet, a Python package for gene regulatory network reconstruction using time-series RNA-seq data.
- Investigated fundamental limits on binary classification errors and causal network inference.
- Taught ECE 313 (Probability with Engineering Applications, 60+ students).

### Cisco Systems, Inc.

San Jose, CA

SOFTWARE ENGINEERING INTERN

May–Aug. 2015

- Developed a Django-based web app for debugging networking applications.

## Education

### Arizona State University

Tempe, AZ

PH.D. IN ELECTRICAL ENGINEERING

2015

- Dissertation: “Performance analysis of low-complexity resource-allocation algorithms in stochastic networks using fluid models.”

### Tsinghua University

Beijing, China

B.E. IN ELECTRONIC ENGINEERING

2009

## Honors & Awards

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|------|--|-------------------|
| 2019 | <b>Helmsley Fellowship</b> , Frontiers and Techniques in Plant Science Course, Cold Spring Harbor Laboratory | Laurel Hollow, NY |
| 2015 | <b>The First Place Team</b> , Cisco Intern Hackathon   | San Jose, CA      |
| 2015 | <b>Best Paper Award</b> , IEEE Conference on Computer Communications (INFOCOM)                               | Hong Kong, China  |
| 2014 | <b>Exemplary Reviewer</b> , IEEE Communications Letters  |                   |

## Research Projects

### Gene regulatory network reconstruction

- Studied the importance of condition diversity in time series experiments where each individual is only sampled once (one-shot sampling).
- Explored the connection between ODE models and graph models for gene regulatory networks.
- Developed CausNet, a framework for sparse causal network reconstruction using a Gaussian approximation of bootstrapping to provide reliability scores for predicted regulatory interactions.
- Discovered a novel photoperiodic flowering pathway of soybean using CausNet.

### Fundamental limits on binary classification errors and causal network inference

- Derived a maximum likelihood estimator of the receiver operating characteristic curve for a binary classification problem.
- Provided a lower bound on the information requirements for causal network inference.

### Scheduling algorithms in computer and communication networks

- Analyzed low-complexity algorithms for scheduling real-time traffic in wireless networks.
- Proposed batch-filling, a randomized load balancing algorithm for large computing systems with strong performance guarantees and low messaging overhead.

## Professional Service

- Reviewer for IEEE/ACM Transactions on Networking, Queueing Systems, IEEE Transactions on Mobile Computing, IEEE Communications Letters, IEEE Transactions on Vehicular Technology, IEEE Signal Processing Letters, IEEE Transactions on Network Science and Engineering, and IEEE International Symposium on Information Theory.
- Technical Program Committee member for ACM MobiHoc 2019–2022, and WiOpt 2021.

## Skills

PYTHON, UNIX, GIT, C/C++, MATLAB, R, DJANGO, HUGO, PYTORCH