# Kenneth Hung

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## EDUCATION

**University of California, Berkeley**  —  Berkeley, CA
*Ph.D. in Mathematics; Advisor: Prof. William Fithian; GPA: 3.9/4.0*  —  *Aug. 2014 – May 2019*

**California Institute of Technology (Caltech)**  —  Pasadena, CA
*B.S. with Honors in Mathematics and Computer Science (minor); GPA: 4.0/4.0*  —  *Sept. 2010 – May 2014*

## PUBLICATION AND PREPRINTS

**Empirical Bayesian selection for value maximization**
*Dominic Coey and Kenneth Hung, arXiv*  —  *2022*

- **Regret bound**: Proof of a regret bound when solving a choose-$m$-out-of-$n$-items problem using an empirical Bayesian approach
- **Semi-synthetic simulations**: Simulation based on publicly available datasets to illustrate the regret in a parametric case, achieving the proved regret bound under correct specification

**Critical groups of strongly regular graphs and their generalizations**
*Kenneth Hung and Chi Ho Yuen, Innovations in Incidence Geometry*  —  *2022*

- **Maximal order of a critical group**: Explicit constructed an element in the critical group of graph Laplacians with exactly two non-zero eigenvalues, that achieves the spectral bound for all such graphs except for notable exceptions

**Statistical methods for replicability assessment**
*Kenneth Hung and William Fithian, Annals of Applied Statistics*  —  *2020*

- **Meta-analysis**: Analyzed dataset from experimental psychology replications to quantitatively answer previously vague questions about replicability in the scientific domain
- **Multiple testing and post-selection inference**: Developed new tests and new metrics for replicability analysis
- **Simulations and recommendations**: Simulations and data visualizations in support of better future scientific practices

**Rank verification for exponential families**
*Kenneth Hung and William Fithian, Annals of Statistics*  —  *2019*

- **Multiple comparison with sample best**: Devised a more powerful approach to this classical problem that handles sparse large parameters without sacrificing power in the dense case
- **Simulations**: Demonstrated gains in power using Matlab, Python and R

## PRESENTATIONS

**Content moderation and experimentation at Meta**  —  Berkeley, CA
*Invited joint talk, Simons Institute Annual Industry Day*  —  *2022*

**Empirical Bayesian selection for value maximization**  —  Cambridge, MA
*Talk, Conference on Digital Experimentation (CODE)*  —  *2022*

**Large-scale metric defense**  —  Virtual
*Poster, Conference on Digital Experimentation (CODE)*  —  *2021*

**Statistical methods for replicability assessment**  —  Virtual
*Invited talk, International Seminar on Selective Inference (ISSI)*  —  *2021*

**Statistical methods for replicability assessment**  —  Virtual
*Invited talk, Joint Statistical Meeting (JSM)*  —  *2021*

**Rank verification for exponential families**  —  St. Louis, MO
*Poster, Workshop on Higher-Order Asymptotics and Post-Selection Inference (WHOA-PSI)*  —  *2017*

**Rank verification for exponential families**  —  Riverside, CA
*Talk, International Conference on Multiple Comparison Procedures (MCP)*  —  *2017*

## Work Experience

**Meta Platforms Inc.**                                                      San Francisco, CA
*Research Scientist, Core Data Science*                                       *Jul. 2019 – Present*

- **Meta-analysis of experimental data**: Improved experimentation efficiency and quality through empirical Bayesian methods
- **Causal inference**: Semiparametric-efficient estimation in experiments, treatment effect estimation in experiments with spillover

**Citadel LLC**                                                              Chicago, IL
*Quantitative Researcher Intern*                                             *May 2017 – Aug. 2017*

- **Market making team**: Two projects on high frequency trading stock price predictive models
- **Model selection**: Investigated new high-dimensional feature selection in linear models for best model and best model path
- **Machine learning methods**: Predictive models based on kernel methods and random forests using R

**Facebook Inc.**                                                            Menlo Park, CA
*Software Engineer Intern*                                                   *Jun. 2012 – Sept. 2012*

- **Pages team**: Implemented UI elements for page admins and crowd-sourced information using XHP

## Research Experience

**Summer Undergraduate Research Fellowship**                                 Pasadena, CA
*California of Institute of Technology*                                       *Jun. 2013 – Sept. 2013*

- **Algebraic combinatorics**: Critical groups of Strongly Regular Graphs (SRGs); worked under Prof. Mohamed Omar on properties of the critical groups in relation to the parameters

**Summer Undergraduate Research Fellowship**                                 Pasadena, CA
*California of Institute of Technology*                                       *Jun. 2011 – Sept. 2011*

- **Solid Mechanics Group**: Optimizations of the quasicontinuum method on lattice structure computation; worked under Prof. Malena Inés Español. Displacements of atoms in a lattice structure can be found by minimizing the approximation for the total energy; I analyzed several approximations with the help of Matlab for numerical simulations

## Professional Activities

**Causal inference reading group**
*University of California, Berkeley*                                          *Aug. 2016 – May 2019*

- **Topics**: Philosophy, randomized experiment, observational studies, matching, propensity score, DAGs, instrumental variable, sensitivity analysis, regression discontinuity

**Board of Control**
*California of Institute of Technology*                                       *Jan. 2012 – Jun. 2014*

- **House Representative**: Served as representative for Avery House on a committee charged with hearing cases of potential Honor System violations among undergraduates

## Reviewing

**Statistics (number of papers in parentheses)**: Journal of the American Statistical Association (1)

## Honors and Awards

**Outstanding Graduate Student Instructor, UC Berkeley**
*Awarded for outstanding work in the teaching of undergraduates*                           *2018*

**Scott Russell Johnson Undergraduate Prize, Caltech**
*Awarded to the best graduating mathematics major*                                          *2014*

**Herbert J. Ryser Scholarships, Caltech**
*Awarded based on merit, preferably in pure mathematics*                                    *2013*

**The Robert P. Balles Caltech Mathematics Scholars Award, Caltech**

*Awarded based on performance in mathematics courses completed in the student's first three years at Caltech*     *2013*

**Fredrick J. Zeigler Memorial Award, Caltech**

*Awarded for excellence in scholarship*     *2012*

**International Mathematical Olympiad**

*Represented Hong Kong; Bronze and Silver*     *2009, 2010*

**Asian Physics Olympiad**

*Represented Hong Kong; Honorable Mention*     *2010*

## SKILLS

**Programming languages**: C/C++, Mathematica, Matlab, Python, R, SQL

**Languages**: Cantonese, English, Mandarin

**Technologies**: git, LaTeX