Hadi Elzayn

Hadi Elzayn

hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu
https://hselzayn.github.io/

EDUCATION

Stanford University — **Palo Alto, CA**
Postdoctoral Fellowship in Machine Learning and Public Policy — 01/2021-Present

The University of Pennsylvania — **Philadelphia, PA**
Ph.D. in Applied Mathematics and Computational Science — 12/2020
M.A. in Applied Mathematics and Computational Science — 08/2018

Dissertation Title: *Essays on Algorithms, Markets, and Society*

Advisor: Michael Kearns

Selected Coursework: Advanced Machine Learning, Algorithms, Graduate Analysis I (Complex and Real Analysis), Graduate Analysis II (Real and Functional Analysis), Probability Theory, Stochastic Processes, Numerical Linear Algebra, Computational Learning Theory, Game Theory, Adaptive Data Analysis, Deep Learning, Market Design

Columbia University — **New York, NY**
Bachelor of Arts: Double Major in Mathematics and Economics — 05/2013

GPA: 3.8 / 4.0; *Cum Laude*

Economics Departmental Honors

Thesis Title: *The Windy City and Urban Gentry: Does Gentrification Explain the Integration of Chicago?*

Jonathan Throne Kopit Memorial Prize in Logic and Rhetoric for *From Tunis to Beirut: Against Cultural Imperialism in the Name of Women's Rights*

Selected Coursework: Graduate Microeconomics, Advanced Econometrics, Advanced Macroeconomics, Linear Algebra, Analysis and Optimization, Real Analysis I-II, Planar Lattice Models, Data Structures and Algorithms in C, Discrete Mathematics

Editorial Positions: Columbia Economics Review (editor-in-chief), Columbia Political Review (associate editor, Arab Spring columnist)

American University of Beirut — **Beirut, LB**
CAMES Summer Language Institute, Intermediate Arabic — 08/2010

ACADEMIC FELLOWSHIPS

Machine Learning and Public Policy Postdoctoral Fellowship — **Palo Alto, CA**
Stanford University — 12/01/2020

Benjamin Franklin Fellowship — **Philadelphia, PA**
University of Pennsylvania — *09/2016-12/2020*

PEER-REVIEWED PUBLICATIONS AND MANUSCRIPTS

Differentially Private Call Auctions and Market Impact — **EC 2020**
Diana, Elzayn, Kearns, Roth, Sharif-Malvajerdi, Ziani

The Effect of Competition and Regulation on Error Inequality in Data-Driven Markets — **ACM FAT* 2020**
Elzayn, Fish (Oral presentation, best poster award NeuRIPS 2019 AI for Social Good Workshop; EC2020 Poster)

Equilibrium Characterization for Data Acquisition Games — **IJCAI 2019**
Dong, Elzayn, Jabbari, Kearns, Schutzman

Hadi Elzayn

hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu

https://hselzayn.github.io/

Price of Privacy in the Keynesian Beauty Contest	**EC 2019**
Elzayn, Schutzman	

**Hidden Information, Teamwork, and Prediction in Trick-Taking Card Games
(extended abstract)** — **RLDM 2019**
Elzayn, Fereydounian, Hayhoe, Kuma

Fair Algorithms for Learning in Allocation Problems	**ACM FAT* 2019**
Elzayn, Jabbari, Jung, Kearns, Neel, Roth, Schutzman	

ONGOING WORK

Equilibria, Revenue, and Welfare in the Ad Types Problem	**(submitted)**
Elzayn, Colini-Baldeschi, Lan, and Schrijvers	

Algorithms and Learning for Fair Portfolio Design	**(submitted)**
Diana, Dick, Elzayn, Kearns, Schutzman, Sharif-Malvajerdi, Roth, Ziani	

Personalized Privacy and Data Contribution	**(ongoing)**
Elzayn, Gkatzelis, Pountourakis, Ziani	

How Fair is the Mortgage Market? Adapting Fair Machine Learning for Real-world Systems	**(ongoing)**
Elzayn, Freyaldenhoven, Shin	

Strategic Election Dynamics	**(ongoing)**
Elzayn, Schutzman	

WORK EXPERIENCE

Facebook	**Philadelphia, PA**
Systems and Infrastructure PhD Intern	06/2020-08/2020

Developed new implementation of auction algorithms in production C++ codebase
Characterized equilibrium behavior, welfare, and revenue in novel auction formats

Federal Reserve Bank of Philadelphia	**Philadelphia, PA**
Graduate RA	02/2020-05/2020

Applied conceptual tools from machine learning research and analyzing large mortgage datasets to evaluate fairness in the U.S. mortgage market as a whole

Microsoft Research	**Montreal, QC**
Research Intern	06/2019-08/2019

Combined learning theory with industrial organization to model data-driven markets and to characterize group-wise error inequality and firms profits under competition and regulation

Two Sigma Investments	**Philadelphia, PA**
Consultant	02/2019-05/2019

Created new feature set predictive of residual returns from SEC data, used econometric techniques to test for statistical and economic significance, and calculated financial metrics on strategy

Hadi Elzayn
hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu
https://hselzayn.github.io/

TGG Group (The Greatest Good)   **Chicago, IL**
Associate, Senior Associate   09/2013-04/2016

Used quasi-experiment and differences-in-differences framework to estimate price elasticity of demand for financial advising. Created sampling and two-stage regression process to overcome computational constraints on large dataset and estimate fixed effects. Identified evidence of gaming behavior induced by discontinuous marginal incentives (with Steve Levitt)

Computed bootstrapped test statistics via random assignment of placebo treatments in order to mitigate effects of auto- and spatial correlation on standard errors and estimate price elasticity for large credit card acquirer. Designed randomized control trial protocol (with Chad Syverson)

Designed and implemented a negotiation framework using Final Offer Arbitration on behalf of a large insurance company to credibly signal a best offer and avoid costly litigation (with Max Bazerman)

Created decision aids to reduce random variation ("noise") in claims evaluation and premium-setting and analyzed efficacy through results of randomized control trial (with Daniel Kahneman)

TGG Group (The Greatest Good)   **Chicago, IL**
Summer Associate   06/2012-08/2012

Built linear regression model trained on SEC filings to identify firms likely committing accounting fraud

STARTUP EXPERIENCE

StaffMeal   **Chicago, IL**
Co-Founder   10/2015-06/2016

Founded company to connect up-and-coming chefs from fine/unique dining scene in Chicago to customers throwing in-home dinner parties

Executed multiple contracts for positive profits and managed implementation of MVP software product, chef approval, menu testing, inventory purchase, and in-home events

AskZuma   **Chicago, IL**
CEO   10/2015-08/2016

Built proof-of-concept in python and managed team of programmers implementing product – a web/ mobile app paired with white-glove service to help users avoid getting ripped off in their car repairs

Grew estimate base from zero estimates to 30K monthly via organic growth and users from zero to several thousand

Managed relationships with data suppliers and automotive companies, trained adjusters in customer handling process, oversaw branding development and marketing

COLLABORATIONS IN OTHER DISCIPLINES

Heart transplant waiting list implications of increased ventricular assist device use as a bridge to transplant: a national analysis.   **Artificial Organs**
Han, Elzayn, Duda, Acker, Patrick, Iyengar, Helmers, Birati, Atluri

Heart waiting-list implications of increased ventricular assistive device transplant use as bridge to transplant: a national database analysis (abstract)   **STS 2019**
Han, Elzayn, Atluri

Hadi Elzayn
hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu
https://hselzayn.github.io/

Long-term impacts of reducing pulmonary vascular resistance with VAD therapy in bridge-to-transplant patients (abstract)	**ASAIO 2017**
Han, Kanade, Chung, Chen, Elzayn, Gaffey, Rame, Acker, Atluri	

INVITED TALKS

How Fair is the Mortgage Market? Adapting Fair Machine Learning for Real-world Systems	**Virtual**
INFORMS 2020, Machine Learning and Markets session	11/08/2020
Fair Algorithms for Learning and Allocation Problems	**Virtual**
Facebook Fairness Group	07/31/2020
Differentially Private Call Auctions and Market Impact	**Virtual**
Drexel University Theory Seminar	07/24/2020
Differentially Private Call Auctions and Market Impact	**Virtual**
Facebook Economics, Algorithms, and Optimization Group	07/13/2020
Fairness, Learning, and Economics	**London, U.K.**
Cervest Earth	01/31/2020

PUBLICATION TALKS

Differentially Private Call Auctions and Market Impact	**Virtual**
ACM EC 2020	07/15/2020
The Effect of Competition and Regulation on Error Inequality in Data-Driven Markets	**Barcelona, ES**
ACM FAT* 2020	01/30/2020
The Effect of Competition and Regulation on Error Inequality in Data-Driven Markets	**Vancouver, BC**
NeuRIPS AI for Social Good Workshop 2019	12/14/2019
The Price of Privacy in the Keynesian Beauty Contest	**Phoenix, AZ**
ACM EC 2019	*06/27/19*

PEDAGOGICAL TALKS

Fast Rates in Statistical and Online Learning	**Philadelphia, PA**
Advanced Machine Learning	11/20/18
Deep Dive: Theory for Generative Adversarial Networks	**Philadelphia, PA**
Deep Learning Seminar	09/25/18

TEACHING EXPERIENCE

Penn Mathematics – Undergraduate Directed Reading Program	**University of Pennsylvania**
Mentor	Spring 2020
NETS 412: Algorithmic Game Theory	**University of Pennsylvania**
Teaching Assistant for Bo Waggoner	Spring 2018
AMCS 602: Algebraic Techniques I	**University of Pennsylvania**
Grader for Zhenfu Wang	Fall 2017

Hadi Elzayn

hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu

https://hselzayn.github.io/

PUBLIC ENGAGEMENT

Radical ideas spread through social media. Are the algorithms to blame?

PBS Nova – named interview   Spring 2019

Why Algorithms Need Ethics (and How We Can Teach Them)   **University of Pennsylvania**

University of Pennsylvania 60-second SLAM lecture   Spring 2019

PROFESSIONAL SERVICE

ACM Conference on Economics and Computation	**Budapest, HU**
Program Committee	2021
AAAI Conference on Artificial Intelligence	**Vancouver**
Reviewer	2021
Machine Learning and Economic Policy Workshop at NeuRIPS 2020	**Virtual**
Reviewer	2020
ML Retrospectives, Surveys, and Meta-analyses Workshop at NeuRIPS 2020	**Virtual**
Reviewer	2020
Journal of Machine Learning Research	
Reviewer	2020
Conference on Neural Information Processing Systems	**Virtual**
Reviewer	2020
ACM EC Algorithmic Game Theory Mentoring Workshop	**Virtual**
Mentor	2020
ACM Conference on Economics and Computation	**Virtual**
Subreviewer	2020
International Conference on Machine Learning	**Vancouver, BC**
Reviewer (top 1/3 of reviewers)	2020
ACM Conference on Economics and Computation	**Budapest, HU**
Reviewer	2020
AAAI Conference on Artificial Intelligence	**New York, NY**
Reviewer	2020
Conference on Neural Information Processing Systems	**Vancouver, BC**
Reviewer (top 5% of reviewers)	2019
International Conference on Machine Learning	**Long Beach, CA**
Reviewer	2019
ACM Conference on Economics and Computation	**Ithaca, NY**
Subreviewer	2018

Hadi Elzayn

hselzayn@gmail.com | 310-923-5478 | hselzayn@law.stanford.edu

https://hselzayn.github.io/

PROFESSIONAL DEVELOPMENT

ACM FAT* Doctoral Consortium   **Atlanta, GA**
Attendee   2019

EC Algorithmic Game Theory Mentoring Workshop   **Ithaca, NY**
Attendee   2018

VOLUNTEER SERVICE

PA Democrats Victory 2020   **Philadelphia, PA**
Data munging   10/2020

Kayany Foundation Schools for Syrian Refugees   **Bekaa Valley, LB**
Teacher   07/2016

SKILLS

Programming Languages: Python, R, SQL, JavaScript, C++

Tools, Packages, and Applications: Matlab, Stata, SAS, LaTeX, HTML, CSS, jQuery, D3, MS Office Suite

Languages: English (native), Arabic (intermediate), Spanish (proficient), French (intermediate)

MISCELLANEOUS

Citadel Datathon: 3rd Place team finish 2020 Summer Invitational

Citadel AI Competition: Participant Terminal Live 2020 Penn vs. Princeton

Citadel Datathon: 2nd Place team finish 2019 East Coast Regional

INTERESTS

Fencing, Mountaineering, Oud