Francisco J. Marmolejo-Cossío

Lowell House, 10 Holyoke Pl, Cambridge, MA, 02138
fjmarmol@seas.harvard.edu • +1 857-320-8804
https://www.fmarmolejo.com/

RESEARCH DISCIPLINES	**Applied Modeling, Algorithmic Design, Optimization, Game Theory, AI**

EDUCATION

University of Oxford, Oxford, UK

- D.Phil. in Computer Science — 2015 – 2020
  - Title: "Equilibrium Computation in Games and Strategic Aspects of Bitcoin Mining"
- M.Sc. in Mathematics and the Foundations of Computer Science — 2014 – 2015

Harvard University, Cambridge, Massachusetts, USA

- A.B. in Mathematics with a Secondary in Neurobiology — 2008 – 2012
  - Language Citation in Urdu/Hindi

EMPLOYMENT

Harvard University

- Postdoctoral Fellow — Jul 2021 – Present

Input Output Global (IOG)

- Research Fellow at a leading blockchain infrastructure research and engineering company — Apr 2020 – Present

University of Oxford

- Career Development Fellow and Senior Tutor in Computer Science (Balliol College) — Sep 2019 – Jul 2021

Mahindra & Mahindra, Mumbai, India

- Deputy Manager (Ivy League Global Recruitment Program) — Sep 2012 – Jun 2014

JOURNAL PUBLICATIONS

"Learning Strong Substitutes Demand via Queries"
P. Goldberg, E. Lock, **F. Marmolejo-Cossío**
In *ACM Transactions on Economics and Computation (TEAC)*. Supersedes WINE version below. Jun 2022

"Optimally Deceiving a Learning Leader in Stackelberg Games"
G. Birmpas, J. Gan, A. Hollender, **F. Marmolejo-Cossío**, N. Rajgopal, A. Voudouris
In *Journal of Artificial Intelligence Research (JAIR)*. Supersedes NeurIPS version below. Oct 2021.

"Health Sentinel: A mobile crowdsourcing platform for self-reported surveys provides early detection of COVID-19 clusters in San Luis Potosí, Mexico"
S. Ruiz-Correa, R. López-Revilla, F. Díaz-Barriga, **F. Marmolejo-Cossío**, V. Robledo-Valero, E. Hernández-Huérfano, L. Álvarez-Rivera, M. Rangel-Martínez, M. Lutzow-Steiner, L. Ortiz-Vázquez, A. Mendoza-Lara M. Olivo-Rodríguez, M. Galván-Ramírez, A. Morales-Neria, V. Martínez-Donjuan, M. Cervantes-Irurzo, A. Comas-García, F. Maldonado, C. Aguilar-Acosta.
In *International Journal of Medical Informatics*. Sep 2021.

"Concentrating Pooled COVID-19 Patient Lysates to Improve Reverse Transcription Quantitative PCR Sensitivity and Efficiency"
H. Sanghani, D. Nawrot, **F. Marmolejo-Cossío**, J. Taylor, J. Craft, E. Kalimeris, M. Andersson, S. Vasudevan,
In *Clinical Chemistry*. May 2021.

"Learning Convex Partitions and Computing Game-theoretic Equilibria from Best Response Queries"
P. Goldberg, **F. Marmolejo-Cossío**
In *ACM Transactions on Economics and Computation (TEAC)*. Supersedes WINE version below. Mar 2021.

"Logarithmic Query Complexity for Approximate Nash Computation in Large Games"
P. Goldberg, **F. Marmolejo-Cossío**, and Z. Steven Wu,
In *Theory of Computing Systems (TOCS)*. Supersedes SAGT version below. Jan 2019.

CONFERENCE PUBLICATIONS

"Strategic Liquidity Provision in Uniswap v3"
Z. Fan, **F. Marmolejo-Cossío**, D. J. Moroz, M. Neuder, R. Rao, D. C. Parkes.
To appear in *Proceedings of The Fifth International Conference on Advances in Financial Technologies (AFT)*. Oct 2023.

"Welfare-Maximizing Pooled Testing"
S. Finster, M. González-Amador, E. Lock, **F. Marmolejo-Cossío**, E. Micha, A.D. Procaccia.
In *Proceedings of Twenty-Fourth ACM Conference on Economics and Computation (EC)*. Jul 2023.
Exemplary Applied Modeling Track Paper Award.

"Differential Liquidity Provision in Uniswap v3 and Implications for Contract Design"
B. Altschuler, Z. Fan, **F. Marmolejo-Cossío**, D. C. Parkes, H. Sun, X. Wang.
In *Proceedings of 3rd ACM International Conference on AI in Finaince (ICAIF)*. Nov 2022.

"Decentralised Update Selection with Semi-Strategic Experts"
G. Amanatidis, G. Birmpas, P. Lazos, **F. Marmolejo-Cossío**
In *Proceedings of 15th International Symposium on Algorithmic Game Theory (SAGT)*. Oct 2022.

"Optimal Testing and Containment Strategies for Universities in Mexico amid COVID-19"
E. Lock, **F. Marmolejo-Cossío**, J. Jonnerby, N. Rajgopal, H. Guzmán-Gutiérrez, L. Benavides, R. Tello-Ayala, P. Lazos
In *Proceedings of 1st ACM Conference on Equity and Access in Algorithms, Mechanisms and Optimization (EAAMO)*. Oct 2021.

"RPPLNS: Pay-per-last-N-shares with a Randomised Twist"
P. Lazos, **F. Marmolejo-Cossío**, X. Zhou, J. Katz
In *Proceedings of 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. May 2021.

"Optimally Deceiving a Learning Leader in Stackelberg Games"
G. Birmpas, J. Gan, A. Hollender, **F. Marmolejo-Cossío**, N. Rajgopal, A. Voudouris
In *Proceedings of Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS)*. Dec 2020.

"Learning Strong Substitutes Demand via Queries"
P. Goldberg, E. Lock, **F. Marmolejo-Cossío**
In *Proceedings of The 16th Conference on Web and Internet Economics (WINE)*. Dec 2020.
Nominated for Best Paper.

"Fairness and Efficiency in DAG-based Cryptocurrencies"
G. Birmpas, E. Koutsoupias, P. Lazos, **F. Marmolejo-Cossío**
In *Proceedings of 24th International Conference on Financial Cryptography and Data Security (FC)*. Feb 2020.

"Competing (Semi)-Selfish Miners in Bitcoin"
F. Marmolejo-Cossío, E. Brigham, B. Sela, J. Katz
In *Proceedings of 1st ACM conference on Advances in Financial Technologies (AFT)*. Oct 2019.

"Learning Convex Partitions and Computing Game-theoretic Equilibria from Best Response Queries"
P. Goldberg, **F. Marmolejo-Cossío**
In *Proceedings of 14th Conference on Web and Internet Economics (WINE)*. Dec 2018.
Selected for special edition of *ACM Transactions on Economics and Computation (TEAC)*.

"Logarithmic Query Complexity for Approximate Nash Computation in Large Games"
P. Goldberg, **F. Marmolejo-Cossío**, and Z. Steven Wu
In *Proceedings of 9th International Symposium on Algorithmic Game Theory (SAGT)*. Sep 2016.
Selected for special edition of *Theory of Computing Systems (TOCS)*.

REPORTS & INFORMAL PUBLICATIONS

"Novel Practices and Highlights from the Fourth Workshop on Mechanism Design for Social Good"
F. Marmolejo-Cossío, F. Monachou
In *ACM SIGAI AI Matters*. Mar 2021.

"Diagnosticar para controlar: cómo maximizar el impacto en el uso de pruebas COVID-19 escasas"
F. Marmolejo-Cossío
In *Consejo Potosino de Ciencia y Tecnología (COPOCYT) TecnoDisruptiva*. Jan 2021.

"Maximising the Benefits of an Acutely Limited Number of COVID-19 Tests"
J. Jonnerby, P. Lazos, E. Lock, **F. Marmolejo-Cossío**, C. Ramsay, D. Sridhar
In *Harvard AI for Social Good Workshop (2020)*.

ONGOING PROJECTS

"Balancing Participation and Decentralization in Proof-of-Stake Cryptocurrencies"
A. Kiayias, E. Koutsoupias, **F. Marmolejo-Cossío**, A. Stouka

TEACHING	**University of Oxford**	

- Lectures
  - "Cryptocurrencies and Property Law", *Law and Computer Science* — 2020 – Present
  - "Online Learning, Mistake Bounds, and the Perceptron Algorithm", *Computational Learning Theory* — Fall 2016
- College Tutorials — 2016 – 2021
  - Linear Algebra, Discrete Mathematics, Computational Learning Theory, Models of Computation, Design and Analysis of Algorithms, Algorithms and Data Structures, Imperative Programming, Functional Programming, Continuous Mathematics, Machine Learning, Introduction to Formal Proof, and Computational Game Theory.

Harvard University

- Co-Instructor
  - CS 136: Economics and Computation — Fall 2023
- Teaching Fellow
  - Business in Analytics Program: Data-Driven Marketing — Fall 2023
- Course Assistant
  - CS 220: Cryptography — Fall 2011
  - Math 112: Real Analysis — Spring 2010

SUPERVISION	**Postdoctoral Supervision**	

- Héctor Alonso Guzmán Gutiérrez, IPICyT — Jan 2021 – May 2022

Ph.D. Supervision
- Eric Mibuari, Harvard University — Sep 2023 – Present
- Zhou Fan, Harvard University — Oct 2021 – Present

Research Fellow Supervision
- José Roberto Tello Ayala, ITAM — May 2021 – May 2022

M.Sc. Thesis Supervision
- Amrita Khandpur, University of Edinburgh — Summer 2020
- Elizabeth Smith, University of Oxford — Summer 2019
- Leo Falcomer-Dawson, University of Oxford — Summer 2017

Undergraduate Thesis Supervision
- Sarthak Jain, University of Oxford — Fall 2020 – Spring 2021

REU Supervision
- Viridiana Camacho Pánfilo, CENESPO — Summer 2023
- Edna Marlene Martínez Hernández, UANL — Summer 2022
- Eira Krystel González Pérez, UISLP — Summer 2022

AWARDS & SCHOLARSHIPS	

- Exemplary Applied Modeling Track Paper, EC — 2023
- Nominated for Excellence in Academic Advising Award, Harvard University — 2023
- Finalist for Junior Fellowship, Harvard Society of Fellows — 2022
- Best Paper Nomination, WINE — 2020
- Career Development Fellowship, Balliol College, University of Oxford — 2019 – 2021
- Computer Science Departmental Teaching Award, University of Oxford — 2019
- Outstanding Tutor Nomination, University of Oxford — 2019
- Special Issue of ACM Transactions on Economics and Computation for WINE — 2018
- Special Issue of ACM Transactions on Economics and Computation for SAGT — 2016

GRANTS	**U.S. Embassy (CDMX) Activities Grant** — 2023

Awarded $8,800$ as PI from the the US Embassy in CDMX in support of the REDNACECYT-MD4SG Summer of Science.

Sloan Foundation Activities Grant — 2022

Awarded $36,000$ as co-PI from the the Sloan Foundation to for the 1st in-person ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization.

Global Challenges in Economics and Computation — 2020 – 2022

Awarded $25,000$ as PI from the ACM Special Interest Group on Economics and Computation (SIGecom) for project titled: "Maximising the Benefits of an Acutely Limited Number of COVID-19 Tests in San Luis Potosí, Mexico".

SIGAI Activities Grant — 2020

Awarded $1,200$ from the ACM Special Interest Group on Artificial Intelligence (SIGAI) to fund the 4th Workshop on Mechanism Design for Social Good (MD4SG'20) which took place virtually due to the COVID-19 pandemic.

| **INVITED TALKS AND PANELS (SELECTED)** | "**Welfare-Maximizing Pooled Testing**", at the *Economics and Computation Session*, INFORMS, Oct 2023. |

"**Welfare-Maximizing Pooled Testing**", at the *Economics and Computation Session*, INFORMS, Oct 2023.

"**Strategic Liquidity Provision in Uniswap v3**", at the *Topics in Finance Session*, INFORMS, Oct 2023.

"**Differential Liquidity Provision in Uniswap v3 and Implications for Contract Design**", at the *UCSB-ECON DeFi Seminar*, Mar 2023.

"**Differential Liquidity Provision in Uniswap v3 and Implications for Contract Design**", at the *Digital Finance and Technology Session*, INFORMS, Oct 2022.

"**Data Science and Impacted Communities**", at the *Academic Data Science Alliance Spring Meeting*, May 2022.

"**Fostering Geographical Diversity in Academic Conferences**", at the *Diversity/PSOR/MIF: Diversity, Equity and Inclusion in OR/MS/Analytics: Innovations in Research and Practice Cluster*, INFORMS, Oct 2021.

"**Maximizing the Utility of a Limited Number of COVID Tests**", at the *Harvard EconCS Seminar*, Sep 2021.

"**ICWSM and the Global Research Community**", at the *15th International Conference on Web and Social Media*, Invited Panelist, Jun 2021.

"**Mechanism Design for Social Good: Maximising the Utility of a Limited Number of COVID Tests**", at the *ELLIS Human-Centric Machine Learning Workshop*, May 2021.

"**Los desafíos de la investigación en tiempos de pandemia: perspectivas desde ángulos diferentes (y complementarios)**", at the *COPOCyT Interdisciplinary Seminar*, Mar 2020.

"**Optimally Deceiving a Learning Leader in Stackelberg Games**", at the *UC Boulder Theory Seminar*, Feb 2021.

''**Fairness and Efficiency in DAG-based Cryptocurrencies**," at the *24th Conference on Financial Cryptography and Data Security*, Sep 2016.

"**Competing (Semi-)Selfish Miners in Bitcoin**" at the *The 1st ACM Conference on Advances in Financial Technology*, Oct 2018.

"**Learning Convex Partitions and Computing Game-theoretic Equilibria from Best Response Queries**," at the *The 14th Conference on Web and Internet Economics (WINE)*, Dec 2018.

"**Logarithmic Query Complexity for Approximate Nash Computation in Large Games**," at the *The 9th International Symposium on Algorithmic Game Theory (SAGT)*, Sep 2016.

ACADEMIC SERVICE

Mechanism Design for Social Good (MD4SG)

▪ Initiative-wide Organizer	Jan 2020 – Present
▪ Latin America and Carribean Working Group Organizer	Jan 2021 – Present
▪ Director and Founder of MD4SG Female Indigenous Summer of Science	Jan 2022 – Present
▪ Development Working Group Organizer	Jan 2019 – Jan 2020

Conference Organization

- ▪ EAAMO 2022, 2023: Funding Chair
- ▪ WINE 2021: Global Diversity Chair
- ▪ EAAMO 2021: General Chair
- ▪ MD4SG 2020: Program Chair

Program Committee Membership

- ▪ EC 2021, 2023; MARBLE 2023; Tokenomics 2022, 2023; MD4SG 2019; WWW 2021

Journal Revision

- ▪ Harvard Data Science Review

Conference Revision

- ▪ SODA 2021, 2022, 2023; WINE 2018, 2019, 2022; WWW 2022; SAGT 2016, 2018, 2022; NeurIPS 2020, 2022; ICLR 2021, 2022; EC 2018; COMSOC 2018

LANGUAGES

- ▪ **Native Proficiency:** English, Spanish; **Fluent:** French; **Advanced Proficiency:** Urdu/Hindi, Italian