

Barnabé Monnot PhD

Algorithmic game theory and cryptoeconomics

Education

- 2014–2019 **PhD in Engineering Systems & Design**, *Singapore University of Technology and Design*, Singapore.
Thesis in algorithmic game theory under the direction of Prof. Georgios Piliouras. Special interest in cities, data and transportation.
- Lead analysis of a large granular dataset collected from sensors carried by over 80,000 students in Singapore. Theoretical results in algorithmic game theory. Developed, ran and analyzed behavioral experiments with over 200 subjects.
 - Publications in major international conferences: STACS, WINE, AAMAS, CompleNet, CSD&M Asia.
 - Teach Node.js development and work with a team of Undergraduates as part of Research Project: Building an online scalable application for behavioral experiments.
Title: **Efficiency, Regret and Inequality in Decentralized Systems**
Oral defense on June 4th, 2019. Graduated August 13th, 2019.
- 2012–2014 **Master in Applied Mathematics**, *Université Paris Dauphine*, France.
Specialization in PDEs and game theory with application to stochastic and financial modeling. Master thesis written under the direction of Prof. Nicolas Vieille. Title: **Markov games**.
- 2009–2012 **Licence in Applied Mathematics**, *Université Paris Dauphine*, France.
Exchange semester in University of Hong Kong, summer programs in University of Chicago and Copenhagen Business School.

Experience

- Summer 2013 **Data Analyst Internship**, *Lemon Way*, Paris, France.
Research on unsupervised methods for clustering accounts and outlier detection. Development of an online visual application to interactively explore data collected by the mobile payment company and target fraudulent accounts (JavaScript + D3).
- Summer 2012 **Research Internship**, *Université Paris Dauphine*, France.
Work under Prof. Françoise Forges in game theory, with a focus on public good games.

Programming tools

Analytics	Scala/Spark, R (dplyr, ggplot), SQL
Web Apps	HTML/CSS, Javascript (D3), Node.js, MongoDB, web3
Scientific	Octave/Matlab, Mathematica
General	Python, C, git, Solidity

Languages

French	Native Speaker
English	Near Native
Spanish	Intermediate

Recommendations

Prof. Georgios Piliouras, georgios@sutd.edu.sg
Prof. Christos Papadimitriou, christos@cs.columbia.edu
Prof. Marco Scarsini, marco.scarsini@gmail.com

Publications

Kurtulus Gemici, Elias Koutsoupias, Barnabé Monnot, Christos H Papadimitriou, and Georgios Piliouras. Wealth inequality and the price of anarchy. In *36th International Symposium on Theoretical Aspects of Computer Science (STACS 2019)*. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2019.

Barnabé Monnot, Francisco Benita, and Georgios Piliouras. Routing games in the wild: Efficiency, equilibration and regret. In *International Conference on Web and Internet Economics*, pages 340–353. Springer, 2017.

Barnabé Monnot and Georgios Piliouras. Limits and limitations of no-regret learning in games. *The Knowledge Engineering Review*, 32, 2017.

Barnabé Monnot, Erik Wilhelm, Georgios Piliouras, Yuren Zhou, Daniel Dahlmeier, Hai Yun Lu, and Wang Jin. Inferring activities and optimal trips: Lessons from singapore’s national science experiment. In *Complex Systems Design & Management Asia*, pages 247–264. Springer, 2016.

Barnabé Monnot and Justin Ruths. Sensitivity of network controllability to weight-based edge thresholding. In *Complex Networks VII*, pages 45–61. Springer International Publishing, 2016.

Manuscripts

Barnabé Monnot, Zsombor Méder, Georgios Piliouras. When does sparse information seeding induce efficient equilibrium selection? In submission.

Teaching

2016–2017 Object-oriented Javascript and Node.js + Basic statistics with R (10 hours), taught to undergraduates who signed up for the Research Opportunity Programme (UROP).

Spring 2016 Teaching Assistant in Networked Life with Prof. Costas Courcoubetis, SUTD. Developed machine learning project on collaborative filtering with restricted Boltzmann machines **[Link]**. Received Outstanding Teaching Assistant award + University Teaching Excellence award.

Summer 2015 Teaching Assistant in Mathematical Finance with Prof. Daniel Mitchell, SUTD.

2015–2016 Taught French two hours per week, approx. 20 weeks for French Connection Student Club at SUTD.

2012–2014 Private tuition in Mathematics, middle school to University students.

Other activities

2019–Now hackingresea.ch founder and writer. Website to provide interactive, visual introductions to cryptoeconomics, a field encompassing algorithms, game theory, distributed systems and cryptocurrencies. **[Link]**

2015–Now ESD Graduate Seminar main organizer. Co-organizer of the ESD Graduate Summer Conference, where first and second year graduate students present summer research projects. **[Link]**

2015–2017 Development of arenaLabs, online platform to run large behavioral experiments. Web application written in Node.js, supported by Heroku and MongoDB. Platform is used in subsequent research.

2010-2015 Co-founder of *iPhilo*, philosophy news and essays magazine + iOS application. Development of the iOS app in Objective-C.

2010–2014 Founding member of Dauphine’s student newspaper, *La Plume*. General secretary (2012–2013), layout designer, website administrator.

Grants and awards

- Dec. 2018 Winning team at ETHSingapore, Ethereum Global hackathon.
- Winter 2018 University Teaching Excellence award, SUTD.
- Spring 2016 Outstanding Teaching Assistant for Networked Life, SUTD.
- 2014–2018 President Graduate Fellowship scholarship for graduate studies in Singapore.
- 2012 Grand Prize in Political short story competition, Conférence Olivaint, Paris.

Conference and seminar talks

- Jul. 2019 Wealth inequality and the price of anarchy, Poster + Flash talk, TU Creta, Greece.
- Jun. 2019 Efficiency, regret and inequality in decentralised systems, PhD Defense, SUTD, Singapore.
- Mar. 2019 The price of anarchy in real transportation systems, invited speaker, LUISS, Roma, Italia.
- Mar. 2019 Wealth inequality and the price of anarchy, STACS, Berlin, Germany.
- Mar. 2019 The Inspector: an efficient finality test for CBC Casper, ETHParis, Ethereum hackathon, Paris, France.
- Jan. 2019 When does sparse information seeding induce efficient equilibrium selection?, Current Issues in Game Theory and Social Dynamics, SUTD.
- Dec. 2018 StretchVM: cross-shard communication for CBC Casper, ETHSingapore, Ethereum hackathon, Singapore.
- Nov. 2018 Ethereum devcon4, conference on blockchain research and development, invited to attend, Prague, Czech Republic.
- Sep. 2018 RChain's RCon3, conference on blockchain research and development, invited to attend, Berlin, Germany.
- Dec. 2017 Routing Games in the Wild: Efficiency, Equilibration and Regret, WINE 2017, Bangalore, India. **[Link]**
- Jul. 2017 How bad is selfish routing in practice? in Fairness, Accountability and Transparency in Artificial Intelligence (FAT-SG).
- Jul. 2017 Machine Learning: A Flyover, videoconference with Tehran Node of Global Summer School (GSS), Institute for Advanced Architecture of Catalonia. **[Link]**
- Jul. 2017 Science, Technology and Policy in Singapore week-long workshop, co-organized by SUTD, NUS, MIT and ETH. Part of the Smart Mobility team, wrote a report on transportation public policy in Singapore.
- Mar. 2017 Using Mechanical Turk for Behavioral Experiments, Humans of SUTD workshop, SUTD.
- Jan. 2017 Participated in the first Singapore Mathematical Modelisation Challenge, held in SUTD.
- May 2016 Limits and Limitations of No-Regret Learning in Games, AAMAS 2016, Adaptive Learning Agents workshop, Singapore. **[Link]**
- Apr. 2016 Introduction to D3, SUTD. **[Link]**
- Mar. 2016 Sensitivity of Network Controllability to Weight-Based Edge Thresholding, CompleNet 2016, Dijon, France.
- Feb. 2016 Inferring Activities and Optimal Trips: Lessons From Singapore's National Science Experiment, CSD&M Asia 2016, Singapore.
- Dec. 2015 A soft intro to Mean Field Games, ESD Graduate Seminar, SUTD. **[Link]**
- Oct. 2015 Economics and Computation workshop, invited to attend, UC Berkeley, USA.

Review work

Reviewer for WINE 2019, AAI 2018, AAI 2017, EC 2017, SAGT 2016, WINE 2015.

Completed online courses

- Summer 2018 Ethereum and Solidity: The Complete Developer's Guide, Udemy
- Spring 2017 Bitcoin and Cryptocurrency Technologies, Princeton
- Fall 2016 Functional Programming in Scala + Parallel Programming + Big Data Analysis with Spark, EPFL
- Summer 2016 Neural Networks for Machine Learning, University of Toronto
- Spring 2015 Machine Learning, Stanford

Other courses

- Spring 2016 Intellectual Property Clinic, 12 hour course, SUTD

Interests

Cinema, Cycling, Travels, Literature