Julien CODSI

Contact



Erdős number: 3

Codsi, J → Vetta, A
↙
Lovász, L → Erdős

Interests

Graph theory
Combinatorics
Scientific computing
Quantum computing

Languages

French
English

Programming Skills

♥ Julia
Python
Rust
Java
JavaScript
C
LaTeX
Git

Education

2020–present **Ph.D. in Quantum Information Theory** — Université de Montréal
Directed by Professor Gilles Brassard

2021–2022 **MSc in Mathematics and Foundations of Computer Science** — University of Oxford
Awarded with distinction. See my thesis here.

2017–2020 **Bachelor's degree: Mathematics and Computer Science** — Université de Montréal
Awarded with honours, GPA: 4.279 out of 4.3

Academic Internships

2020 **Graph Theory** — Montréal, Canada
With Professor Geňa Hahn

- Studied positional games such as cops and robbers
- Learned advanced combinatorial techniques such as entropy compression

2019 **Analytic number theory** — Montréal, Canada
With Professor Andrew Granville

- Studied analytic number theory with a world leading number theorist
- Mostly studied sieve methods, and specifically the twin primes conjecture

2018 **Operations research/ Optimization** — Montréal, Canada
With Professor Bernard Gendron

- Created an algorithm to approximate functions with piecewise linear functions
- Created an open-source Julia package to implement the algorithm (which I'm still maintaining) See: https://github.com/LICO-labs/LinA.jl
- Applied the algorithm to compete with the state-of-the-art

Work Experience

2020 –2021 **Teaching assistant** — Université de Montréal
IFT1575 – Operational Research
IFT2015 – Data structures (Twice)
IFT2105 – Theoretical computer science
IFT2125 – Algorithmics (Three times)

- Gave weekly 2-hour lectures for up to 100 students
- Created and graded weekly assignments
- Created programming examples and assignments

2017–present **Tutor** — Université de Montréal
Tutored undergraduate students mainly in :

- Linear algebra, real analysis, data structures and theoretical computer science

2016–2017 **Technician** — Edumicro inc.

- Technical support
- Managing inventory and repairing hardware

Publications

Book: A chapter in "Le plaisir des maths" by Bertrand Jouve. (Soon to be published by l'Art-Dit)

Codsi, J., & van de Wetering, J. (Preprint available on Arxiv)
Classically Simulating Quantum Supremacy IQP Circuits through a Random Graph Approach

Codsi, J., Gendron, B., Ulrich Ngueveu (Submitted to Mathematical Programming Computation)
LinA: A faster approach to piecewise linear approximations using corridors and its application to mixed-integer optimization (Preprint available on the open archive HAL)

Codsi, J., & Vetta, A. (2021). A Case Study in Learning in Metagames: Super Smash Bros. Melee. Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment

Attended seminars

Weekly seminar :
Graph theory
Quantum computing

Conferences (1 day +) :
Quantum Physics and Logic 2022
QCrypt 2020
Bellairs's Crypto-Workshop 2020
JuliaCon 2019
JOPT 2019
JOPT 2018

Hobbies

Climbing/bouldering
Video games
Chess

Talks Given

2021 — **A Case Study in Learning in Metagames: Super Smash Bros. Melee**
The 17th AAAI conference on Artificial Intelligence and Interactive Digital Entertainment

2020 — **Mon opinion biaisée sur des bases vectorielles qui ne le sont pas**
Club-math UdeM
On mutually unbiased bases in prime-power dimensions

2019 — **Et si les fonctions savaient multiplier?**
Club-math UdeM
Introduction to multiplicative functions

2019 — **Piecewise Linear Approximation with a Performance Guarantee for Solving MINLPs**
Optimization Days 2019 (JOPT 2019)
Original results in linear optimization presented

2019 — **Coloration of Kneser graphs, a proof from the book**
Université de Montréal's Graph theory seminar
A surprising topological proof of the chromatic number of Kneser graphs

2018 — **Une courbe, c'est juste un paquet de droites non?**
Club-math UdeM
Introduction to linear optimization and linear approximations

Awards and Achievements

2021-present — **Canada Graduate Scholarships – Doctoral (105 000$)**
Natural Sciences and Engineering Research Council of Canada

2021 — **Google PhD Excellence Scholarship (25000$)**
Google

2020 — **Undergraduate Research Grant (6500$)**
Natural Sciences and Engineering Research Council of Canada

2020 — **Excellence Award (500$)**
Université de Montréal
Awarded for having one of the highest GPAs of the University

2019 — **Jacques Saint-Pierre Grant (3000$)**
Université de Montréal
Awarded to the student with the highest GPA of the department

2019 — **Undergraduate Research Grant (6500$)**
Natural Sciences and Engineering Research Council of Canada

2018 — **DIRO Excellency (2000$)**
Université de Montréal
Awarded for having one of the highest GPAs of the department

2018 — **Undergraduate Research Grant (6500$)**
Natural Sciences and Engineering Research Council of Canada

2018 — **Undergraduate Research Grant (2000$)**
Fonds québécois de la recherche sur la nature et les technologies

2018 — **2nd place in theoretical computer science competition**
CS-Games 2018

Social Involvement

2018–2021 — **Organizing weekly conferences on various mathematical subjects for undergraduates**
Université de Montréal

2018–2020 — **Volunteering for the student-run Café**
Café Tore et Fraction

2019–2020 — **Competition organizer and graduate student's representative**
Student association - DIRO Université de Montréal

2018–2021 — **Administrating the math club website**
Which you can see here: https://dms.umontreal.ca/~clubmath/

2018–2020 — **Various volunteering for University events**
On average, 20 hours per semester