

Shang-Chun YU

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shang-chun-yu

EDUCATION

École normale supérieure de Lyon, France

2016 – 2020

Diploma of ENS, Mathematics

Normalien élève

- Specialisation in Probability Theory
- BSc in Mathematics (2016), MSc in Advanced Mathematics (2017 – 2019)

Lycée Janson de Sailly, Paris, France

2014 – 2016

Scientific CPGE – MPSI, MP classes*

Admitted by competition to l'ENS de Lyon and l'École Polytechnique

WORK EXPERIENCE

Full-stack developer (and beyond) | Medelpharm – Beynost, France

September 2023 – Present

Tech: Clojure, Clojurescript/Re-frame

- Developed complex software for tablet compression machines in pharmaceuticals using Clojure, a powerful functional programming language favoured by top-tier developers for its elegance and expressiveness
- Transformed a 7+ year struggle and failure into success in 7 months: revitalised software development and drastically improved product quality through insightful decision-making, effective communication, leading extensive cross-departmental discussions, team mentorship, delivering unprecedented high-quality code, and meticulous technical debt management
- Resolved a 6+ year product design problem in 5 months: leveraged proficiency in UI/UX design to enhance end-user xp., strong comm. skills to connect dev, lab, and marketing teams, creating professionally designed interfaces with complex business logic for scientific and industrial uses, with over 90% of the software designed by me. Prior to this, the company had tried several freelancers and a design agency, but remained dissatisfied

Full-stack developer | Smartfire – Lyon, France

May 2021 – August 2023

Tech: Typescript React, Next.js, Java Spring Boot, Express/Nest.js

- Developed and maintained backends for multiple large e-shop projects (payment, order/cart/stock management, online signature, stock migration, etc.), enhancing code quality with diverse coding principles, integration testing, reducing bugs by over 90%, accelerating development, and boosting team morale
- Conducted code reviews to increase the team's understanding of programming languages and improve overall code quality
- Efficiently understood and refactored complex code bases, reducing bugs and improving code readability, making further development much easier
- Implemented modern UIs for business applications and showcase sites
- Helped build the company's online IDE platform, handling both UI and backend development

RESEARCH EXPERIENCE

Weak approximate higher-order unitary designs

March 2020 – July 2020

with Guillaume Aubrun, Institut Camille Jordan (ICJ) – Lyon, France

Research internship

- Developed a mathematical framework for higher-order objects in quantum information theory
- Generalised a super twirling channel approximation theorem to the whole quantum hierarchical structure

Super quantum channels, higher-order quantum theory

October 2019 – March 2020

with Dr. Michael M. Wolf, Mathematics Centre M5, TUM – Munich, Germany

Research internship

- Studied super quantum channels and higher-order quantum theory
- Generalised common notions to higher-order quantum objects, established the generalised purification theorem

Eigenvalues of polynomials in random permutation matrices and their tensor product

April 2019 – July 2019

with Alice Guionnet, UMPA – Lyon, France

Research internship

- Studied the spectrum convergence of certain operators involving tensor products of random permutation matrices
- Had discussions with Charles Bordenave, the co-author of an article I read, and was later invited to a conference organised by him

Random quantum circuits

May 2018 – June 2018

with Guillaume Aubrun, Institut Camille Jordan (ICJ) – Lyon, France

Research internship

- Studied papers about local random quantum circuits and unitary designs
- Learned path coupling techniques for random walks on unitary operators (probability theory)

WEBSITES

FISH UP Dictionary of Array | array30.misterfishup.com/en

July 2020 – Present

- A website to learn and practice Array, a fast, free and easy-to-learn Chinese input method
- Available in English, French and traditional Chinese (Vue.js/python)
- 2k-3k visitors per month, received many words of thanks and appreciation
- Very well ranked on Google, first result in Chinese language

Daily Digest - COVID-19 IN FRANCE | covid-fr.misterfishup.com/en

January 2021 – Present

- A website that presents daily COVID-19 statistics and news in France in the form of a daily digest
- Available in traditional Chinese, simplified Chinese, English and French (React/python/Figma)

HONOURS

Ranked 1st for PhD Scholarship in Mathematics

2020

For PhD Scholarship in Mathematics in Université Lyon 1

Asian International Teenagers Mathematical Olympiad

2009

Represented Taiwan, won the Gold medal

SKILLS

Languages (proficient): English, French, Mandarin Chinese

Programming languages: javascript/typescript, clojure, python (less familiar but wanted: rust, elixir, ocaml, APL, J)

Productivity: git, latex, vim/nvim

Mathematics: measure theory, probability theory, martingale, Brownian motion, stochastic process

Last update: July 2024