Rand Asswad

PhD Student in Applied Mathematics

(+33) 6 37 03 88 67
rand-asswad.xyz
rand.asswad@inria.fr
github.com/rand-asswad
linkedin.com/in/asswadrand

PhD student in control theory, focused on control of dynamical systems of microorganisms.

Education

Applied Mathematics @ MSTII (Université Grenoble Alpes)
October 2022 – September 2025 *(expected)*

Studied mathematical modelling of microbiological systems, nonlinear systems state observation and control through literature and followed courses:

- Introduction to nonlinear systems & control by H. Khalil - EECI-IGSC program
- State observers for dynamical systems by G. Besançon

Fundamental Mathematics @ Université de Lorraine
September 2021 – August 2022

Audited Master's level courses on Algebra and PDEs.

Mathematical Engineering @ INSA Rouen Normandie
September 2014 – August 2021

French graduate engineering program (Diplôme d'Ingénieur, MEng) with focus on applied mathematics and computer science, specialized in IA and Decision-Making.

Theoretical & Applied Computer Science @ Université de Rouen
September 2019 – August 2020

Research-oriented Master's program (MSc) with focus on algebra and theoretical computer science.

Experience

PhD Student @ Microcosme (Inria de l'Université Grenoble Alpes)
October 2022 – September 2025 *(expected)*

Investigated nonlinear systems of bacteria and microalgae through mathematical analysis and simulation. Currently designing observers for such system for future development of control strategies of algal-bacterial consortia.

Teaching Assistant @ Université Grenoble Alpes
September 2022 – May 2023

- Fundamental mathematical tools for life sciences, L1, Life Sciences (TD, 16 hours)
- Applied mathematics: image processing, L1, Computer Science (TP, 18 hours)

Research Intern @ L2S (Centralesupelec, CNRS)
November 2020 – June 2021

Worked on a bio-inspired geometric model for sound reconstruction. The spectrum of the degraded sound is lifted in the Heisenberg group and reconstructed via the Wilson-Cowan differo-integral equation.
Contributed to an article published in the GSI2021 conference proceedings.
Improved and extended the implementation of the proposed model, and ran experiments on a library of speech recordings.

Research Intern @ Pixel (Inria Nancy Grand Est)
June – August 2019

Contributed to the «Mind the Gap!» algorithm developped by Pixel team that proposes a robust pipeline for generating hexahedral-dominant meshes from any global parametrization of a tetrahedral mesh.
Proposed and implemented improvements to the pipeline that helped obtain better meshes with less irregularities.

Skills

Mathematics & Computer Science Theory

- Algebra
- General Topology & Functional Analysis
- Control Theory
- Signal Processing
- Numerical Analysis
- Optimization
- Probability, Statistics & Data Analysis
- Combinatorics
- Automata Theory & Language Processing
- Data Science & Machine Learning
- Multi-agent Systems & MARL

Programming Languages

- **Basic:** Fortran, Matlab/Octave, Prolog, Lisp, Mathematica, SQL, C#, PHP.
- **Experienced:** bash/shell, C, C++, Python, Julia, Java, JavaScript.
- **Markup:** LaTeX/TeX, HTML+CSS, Markdown.

Libraries & Frameworks

- **Numerical & ML:** numpy, scipy, matplotlib, scikit-learn, PyTorch, TensorFlow.
- **Lexer & Parser Generators:** Lex+Yacc, GNU Flex+Bison, Antlr4.
- **WebDev:** Django, Jekyll, WordPress.

Software & Tools

- **OS:** GNU Linux (Arch, Debian), MS Windows.
- **Version Control:** Git, SVN.
- **Image Processing:** GIMP, Adobe Photoshop, Adobe Illustrator, Blender.

Languages

English *(TOEIC 990/990)*
French *(TCF C1/C2)*
Arabic *(native)*
German *(learning)*

Interests

Violin (Conservatory of St-Etienne du Rouvray), music, cinema, art, hiking, camping.