

Rand Asswad

Engineer in Applied Mathematics

Passionate about mathematics and math-adjacent domains, currently seeking a PhD in applied mathematics for September 2022.

Education

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.

Syrian Scientific Baccalaureate

June 2013

Graduation grade: 92.17%.

Experience

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 @ INRIA Nancy Grand Est

June – August 2019

Contributed to the «Mind the Gap!» algorithm developed 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.

Projects

Music Information Retrieval - Master's Thesis



Research project exploring MIR algorithms for single/multiple pitch estimation and onset detection. Implemented a Python API for the studied algorithms.

Active Contour Models (Snakes)



Studied and implemented active contour models for parametric and level-set curves, evolving the curves by minimizing the mean-curvature or the geodesic metric.

Multi-Agent Reinforcement Learning



Studied Multi-Agent Reinforcement Learning in the framework of Game Theory.

Publication

An auditory cortex model for sound processing



Published article in the GSI2021 conference proceedings

Rand Asswad, Ugo Boscaïn, Giuseppina Turco, Dario Prandi, Ludovic Sacchelli.



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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.

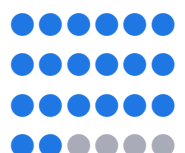
Languages

English (*TOEIC 990/990*)

French (*TCF C1/C2*)

Arabic (*native*)

German (*learning*)



Interests

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