# Rand Asswad

`Engineer in Applied Mathematics`

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

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## 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 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.

## 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 Boscain, Giuseppina Turco, Dario Prandi, Ludovic Sacchelli.

## 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)* ●●●○○○

**Miscellaneous**

Violin (Conservatory of St-Etienne du Rouvray)

## Interests

Music, cinema, art, hiking, camping.