Rand Asswad

Master's Student in
Applied Mathematics & Computer Science

Passionate about mathematics and math-adjacent domains, currently seeking a PhD for September 2021.

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Education

Mathematical Engineering @ INSA Rouen Normandie
September 2014 – August 2021

French graduate engineering program (Diplôme d'Ingénieur) 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 Masters program 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 submitted to the GSI 2021 conference.
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 - Masters Thesis 🔗

Research project exploring MIR algorithms for single/multiple pitch estimation and onset detection. Provided a Python API for these algorithms using own implementation and/or external libraries.

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.

Publications

An auditory cortex model for sound processing 🔗
Preprint accepted in the GSI 2021 conference

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

Skills

Mathematics & Computer Science Theory

▷ Functional Analysis
▷ Control Theory
▷ Signal Processing
▷ Numerical Analysis
▷ Metaheuristics
▷ Probability, Statistics & Data Analysis
▷ Combinatorics
▷ Automata Theory & Language Processing
▷ Multi-agent Systems & MARL

Programming Languages

▷ `Basic:` Fortran, Matlab/Octave, Prolog, Lisp, Mathematica, Javascript, SQL, C#, PHP.
▷ `Experienced:` bash/shell, C, C++, Python, Julia, Java.
▷ `Markup:` LaTeX/TeX, HTML, Markdown.

Libraries & Frameworks

▷ `Python:` numpy, scipy, matplotlib.
▷ `Java:` RMI, Swing.
▷ `Lexer & Parser Generators:` Lex/Yacc, GNU Flex/Bison, Antlr4.
▷ `Web dev:` Django, Jekyll.

Software & Tools

▷ `OS:` GNU Linux, MS Windows.
▷ `Version Control:` Git, SVN.
▷ `Image Processing:` GIMP, Adobe Photoshop, Adobe Illustrator, Blender.

Languages

Language	Level
English	●●●●●○○
French	●●●●●○○
Arabic (native)	●●●●●●●
German (learning)	●●○○○○○

Miscellaneous

Violin (Conservatory of St-Etienne du Rouvray)

Interests

▷ Cinema & Art
▷ Camping & Hiking