Rand Asswad

Engineer in Applied Mathematics

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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 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)*

Interests

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