RUA SULAIMAN

PASSIONATE ABOUT ANALYZING, MODELING, AND VISUALIZING ALL DATA WITH CODE :)

AUB ✉: RMS103@MAIL.AUB.EDU**; PERSONAL ✉:** SULAIMANRUA@GMAIL.COM/ **LINKEDIN:** RUA/LINKEDIN

EDUCATION

American University of Beirut (AUB) — **Beirut, Lebanon**

- **Master of Science (MS) in Physics (Computational Astronomy)** — *Sept 2020 – July 2023*
  Grade: 3.88/4
- **Bachelor of Science (BS) in Physics with a minor in Computer Science:** — *Sep 2017 - June 2020*
  Grade: 3.77/4 (with distinction)

WORK EXPERIENCE

Coding Instructor in three platforms: Geek Express, CodeBrave, and Algorithmics — ***Beirut, Lebanon*** *July 2022 - present*

- Tutoring more than 360 hours of coding in: **Python**, App development (JavaScript), Game development, Scratch, Machine learning, and Robotics for kids between ages 7-14 years.

Physics Tutor in Ostaz (#1 Private Tutoring Platform in the Middle east) and private tutor — ***Beirut, Lebanon*** *April 2022 - present*

- Giving university and high school students sessions in Physics.

Teaching assistant: American University of Beirut, Lebanon — ***Beirut, Lebanon*** *Jan 2022 – May 2022*
Course: *Nonlinear dynamics and Chaos Phys 232C*

- Giving **coding** labs in numerical and dimensional analysis in **Python**.
- Giving and correcting labs and assignments.

Physics lab instructor: American University of Beirut, Lebanon — ***Beirut, Lebanon*** *Sep 2020 – May 2022*
Courses: *Junior laboratory, Modern Physics for Life Science, Electricity and Magnetism.*

- Giving lectures, supervising the lab work, solving, and correcting weekly lab reports and exams.
- Conducting weekly office hours for discussions and questions, along with answering emails.

SCHOLARSHIPS AND AWARDS

- **Fully funded summer research internship** at Max Planck Institute for Astronomy (MPIA) (Internship rejected for personal reasons). — *March 2022*
- **Merit-based Graduate fellowship at AUB:** Full funding for M.Sc. degree — *Sept 2020 – present*
- **Dean's honor list**: American University of Beirut, Lebanon (4/6 semesters) — *Sept 2018 – June 2020*
- **Merit-based Al Ghurair STEM Scholarship (Largest Arab fund):** Full funding for B.Sc. in Physics — *Sept 2017 – June 2020*

RESEARCH EXPERIENCE

Master's thesis at AUB: "Eccentric Debris Disks Around Binaries" — ***Beirut, Lebanon***
Supervisors: Prof. Jihad Touma, Prof. Leonid Klushin, and Prof. Sara Najem. — *July 2022 - present*

- Performing **C++** simulations of thousands of particles using Rebound software followed by intensive statistical analysis.
- Solving numerically the equations using **Python** and **Mathematica** to check for compatibility with theory.

Summer Research Intern at University of Amsterdam, Anton Pannekoek Institute for Astronomy. — **Amsterdam, Netherlands**
Supervisors: Prof. Carsten Dominik, Dr. Christian Ginski — *June 2021 – present*

- Performed **full data reduction** using Polarized Differential Imaging (PDI) technique in **Python** for images.
- Built a complete **model**, using radiative transfer modeling software Radmc3D on **HPC** for the PPdisk.

Research Assistant in Summer Research Experience Program (SREP) at AUB — ***Beirut, Lebanon***
Supervisor: Prof. Jihad Touma — *July 2022*

- Supervised two projects: 1) Exoplanets around binary stars, and 2) Planets inside Eccentric debris disks.
- Generated hundreds of simulations using Rebound software in **C++** to test for different outcomes.
- Analyzed the results **statistically** with **Python**.

- Gave Physics lectures and supervised the final presentations of the projects.

Part of research in Collective Behavior phenomena, AUB. **Beirut, Lebanon**
Supervisor: Prof. Sara Najem *August 2020*

- Designed multiple algorithms (image processing, correlation functions, areas, and circumference) in **MATLAB**.
- **Analyzed** the dynamics of a system of insects to map their motion to well-studied models in statistical mechanics.

RELATED PROJECTS AND COURSES

Projects:

- **Graduate Solid-state Physics: "Simplified Model of Thin Film Growth" (Deposition Diffusion model DD):** (Prof. M. Tabbal)
  - Built a **Python** program to simulate the process of growth of a thin film of material.
  - Produced over 1000 simulations for **statistical analysis** to check compatibility with theory.
- **Graduate Advanced Statistical mechanics: "Dynamical Friction Visited in the Kuiper belt":** (Prof. J. Touma and L. Klushin)
  - Solved dynamical friction equations numerically using **Python** for the Kuiper belt and analyzed the results.
- **Senior Computational Physics: "Turing Patterns":** (Prof. Sara Najem)
  - Presented Alan Turing's paper "The Chemical Basis of Morphogenesis" (Alan Turing, 1952).
  - Built a computational model based on the paper using **MATLAB**.

Courses:

- **Algorithm design and analysis:** advanced searching, sorting, dynamic programming, multi-threaded algorithms, graph algorithms, advanced data structures (ex: Fibonacci and binomial heaps, Minimum spanning trees, etc..) ∴.
- **Intermediate programming and data structures:** data structures (queues, stacks, trees, hash tables…) design, analysis, implementation using C++ language. Greedy, divide-and-conquer, and random algorithms.
- **Computational Physics and Numerical analysis courses:** Numerical integration and differentiation, ODE's, PDE's, statistical algorithms: Markov chain Monte Carlo methods, few quantum algorithms.

COMPUTER SKILLS

- Finished "Data Science" track (Udacity) in **SQL** as part of 1 million coders initiative.
- Operating systems: Windows, Linux, Mac
- Programming languages: Python, Mathematica, C++, MATLAB, Java, and SQL.
- Markup language: Latex.
- Software: Radiative transfer modeling (Radmc3d), N-body simulator (Rebound)
- High Performance Cluster at AUB (HPC)

EXTRACURRICULAR ACTIVITIES

- "**Women in Data Science**" workshop at AUB: Attendee for two days *25-26 April 2023*
- **Insight club at AUB:** Representative. *Jan 2022 – now*
- **MMKN NGO club at AUB:** *Treasurer, member at large* *Sep 2018 – May 2020*
- **Physics Society at AUB:** *Treasurer* *Sep 2019 – June 2020*
- **AUB Hackathon for Big Data and Artificial Intelligence:** *Public Speaker* *Feb – 2019*
- **PADILEIA School (AUB Founded school in Beqaa):** English language conversation partner *Nov 2017 – May 2018*

GENERAL SKILLS AND INTERESTS

- Languages: Arabic (native), English (fluent), and French (elementary).
- Non-academic Interests: Reading books on Religion and Physics, listening to classical music, volunteering.
- Top winner of Quran recitation competition in Insight at AUB.