ISSAR AMRO

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EDUCATION

American University of Beirut (AUB)

- Master of Science in Computational Science (In Progress)
- Bachelor of Science in Physics with Distinction, 2024
- Concentration in Applied Mathematics, 2024

Honors and Awards

- USAID Higher Education Scholarship Program
- Qatar Scholarship - Education Above All Program
- Faculty of Arts and Sciences Dean's Honor List

EXPERIENCE

Graduate Research Assistant, Center for Advanced Mathematical Sciences (CAMS), AUB June 2024 – Present

- Conduct AI and machine learning research for marine science applications, focusing on time series forecasting and the discovery of hidden Phytoplankton-Zooplanktonn dynamics in the Mediterranean Sea.
- Develop deep learning models and advanced AI algorithms to recover hidden dynamical variables and infer governing differential equations from partial measurements of physical systems.
- Investigate dynamical systems and predator-prey interactions, applying physics-informed machine learning to discover underlying ecosystem behavior.
- Implement and optimize data-driven models for time series analysis, leveraging deep neural networks and differential equation-based approaches.

Graduate Teaching Assistant, Mechanical Engineering and ECE Departments at AUB Fall 2024 – Spring 2025

- Assisted in teaching 2 graduate courses; MECH 658 (Introduction to Machine Learning) and EECE 798K (Data-Driven Modeling in Science and Engineering), supporting students in AI, machine learning, and computational modeling.
- Designed and graded homework and exams, ensuring conceptual depth in theory, mathematics, and coding applications.
- Held office hours and guided students in implementing machine learning models, debugging code, and refining theoretical understanding for final projects.
- Led project review sessions, evaluating students' presentations, providing technical feedback, and fostering problem-solving and research skills.

Research Assistant, Department of Mathematics at AUB June 2023 - December 2023
Publication: sciencedirect.com/science/article/abs/pii/S0022247X2400567 5?dgcid=coauthor

- Investigated an open problem in geometrical optics, contributing to the mathematical construction of metasurfaces that satisfy imposed optical conditions.
- Derived and solved a governing partial differential equation (PDE) for metasurface geometry, leveraging numerical methods and Python for visualization.
- Collaborated with a research team to develop a novel approach for solving inverse problems in optics, demonstrating advanced problem-solving and teamwork.
- Co-authored and published a paper titled "Inverse Problems with Hybrid Lenses" in Elsevier's "Journal of Mathematical Analysis and Applications".

Research Assistant, Magnetic Laboratory and Central Research Science Laboratory at AUB October 2022 - April 2023

- Deposited thin films on silicon substrates and analyzed their composition and crystallinity using SEM, XRD, profilometry, and sputtering techniques.

- Studied magnetization dynamics and ferromagnetic resonance (FMR) using automated laboratory software for measurement control and data acquisition.
- Operated and programmed software-controlled lab equipment to optimize experiment scheduling and parameter tuning.
- Processed and analyzed experimental data using Excel and specialized materials science software.

Summer Intern, Department of Physics at AUB July 2022

- Led a research project on planetary dynamics around binary stars, investigating planetary migration and scattering.
- Simulated and analyzed planetary motion using REBOUND (an N-body integrator) in a Linux Ubuntu virtual machine, leveraging Python and C.
- Applied dynamical systems theory and differential equations to predict planetary evolution based on initial conditions and external perturbations.
- Developed real-time 3D visualizations of planetary orbits and collaborated with a team to interpret simulation results.

Private Tutor, Sciences and Mathematics 2021 – Present

- Delivered help sessions in physics, mathematics, and computational methods to high school, undergraduate, and graduate AUB students.
- Assisted students in understanding complex scientific concepts, problem-solving strategies, and mathematical modeling techniques.
- Provided guidance on coding for scientific applications, including numerical methods and data analysis.

PROJECTS

AI-Powered Climate Forecasting and Agricultural Risk Assessment 2025
EECE 798N - AI in Industry, AUB
GITHUB repo: github.com/issaramro/ClimateSmartAI.git

Deep Learning for Discovering Hidden Dynamics 2025
Center for Advanced Mathematical Sciences (CAMS), AUB

Nonlinear Predator-Prey Interaction Models 2024
Phys 218 - Nonlinear Dynamics, AUB

Data-Driven Recovery of Governing Equations 2024
EECE 798K - Data-Driven Modeling in Science and Engineering, AUB
GITHUB repo: github.com/issaramro/RecoveringDynamics.git

Physics-Informed Models of Species Interactions 2024
Phys 299 - Physics in Application, AUB

Time-Delay Embedding of Time Series 2023
Phys 222 - Computational Physics, AUB

Evolution of Neutron Stars and Black Holes 2023
Phys 225 - Astrophysics, AUB

Inverse Problems in Metamaterials 2023
Summer Research Camp in Mathematics, AUB

Magnetization Dynamics in Nanoscale Structures 2023
Undergraduate Research Volunteer Program, AUB

Orbital Dynamics of Planets around Binary Stars 2022
Summer Research Experience in Physics, AUB

TECHNICAL STRENGTHS

Programming Languages	Python, Java, MATLAB, Julia, LaTeX
Data Science	SQL, Pandas, NumPy, Scikit-Learn, TensorFlow, PyTorch, Optuna
Software	Excel, Google Workspace, PowerPoint, MLflow, Git
Cloud	Google Cloud, AWS, Azure
Development Tools	Docker, Kubernetes, FastAPI, Flask, Jupyter Notebook, VS Code, GitHub, CI/CD