

# MOUSSA ATWI

Mathematics ( Scientific Computing || Image Processing )

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## EXPERIENCE

### Doctoral Researcher: Full-time Position (30 hours/week)

#### Exit Wave Reconstruction

**Title:** "Sparse Exit Wave Reconstruction via Deep Unfolding"  
**Keywords:** "Phase Retrieval, Image Processing, Optimization, Deep Neural Networks."  
**Description:** "Incorporating data-driven learning into model-based exit wave reconstruction using deep unfolding to create new hybrid approaches."

RWTH Aachen University

📅 Aug 2023 – Present    📍 Aachen, Germany

### Student Researcher: Part-time Position (20 hours/week)

#### Koopman Theory: *Internship & Master's Thesis*

**Title:** "Approximation of Koopman Operators Using Random Basis Functions"  
**Keywords:** "Koopman operators, Neural Networks, Dynamical Systems."  
**Description:** "Investigated Koopman operator theory and nonlinear dynamical systems; implemented EDMD with random Gaussians and neural networks (trained and untrained) to approximate eigenfunctions and invariant subspaces. Combined theoretical and numerical aspects in Python using the [Deeptime](#) framework."

Zuse Institute Berlin || ZIB

📅 Sep 2022 – May 2023    📍 Berlin, Germany

### Grocery Delivery Rider: Mini-job Position (10 hours/week)

#### E-bike Grocery Courier

**Title:** "Urban Grocery Delivery using E-Bike"  
**Keywords:** "Urban mobility, E-bike delivery."  
**Description:** "Picked up grocery orders from the warehouse and delivered them to customers across Berlin using E-bikes, ensuring timely service and customer satisfaction."

Gorillas GmbH

📅 Oct 2021 – Apr 2022    📍 Berlin, Germany

### Rapid Corona Test: Mini-job Position (10 hours/week)

#### COVID-19 Test Center

**Title:** "Schnelltest and Customer Assistance"  
**Keywords:** "COVID-19 testing."  
**Description:** "Performed Schnelltest at the Kantstrasse test station in Berlin. Guided customers through the registration and testing process."

Teststation Kantstrasse

📅 Jun 2021 – Aug 2021    📍 Berlin, Germany

### Student Researcher: Full-time Position (35 hours/week)

#### Optimal Transport: *Internship & Master's Thesis*

**Title:** "Semi-discrete Optimal Transport for Large-Scale Problems"  
**Keywords:** "Convex Duality, Image Modeling, Gradient Descent."  
**Description:** "Implemented gradient descent and stochastic gradient descent algorithms in Python to solve large-scale semi-discrete optimal transport problems arising in image processing and machine learning. Evaluated algorithmic efficiency and convergence toward optimal solutions."

Université de Bordeaux

📅 Feb 2020 – Aug 2020    📍 Bordeaux, France

## LANGUAGES

- Arabic    • English    • German    • French
- Native    C1    B1    A1

## EDUCATION

- M.Sc. in Scientific Computing (GPA 1.2 ~ Excellent)

Technical University of Berlin || TUB

📅 April 2021 – May 2023    📍 Berlin, Germany

- M.Sc. in Mathematics, Modeling and Simulation

University of Pau and Pays de l'Adour || UPPA

📅 Oct 2019 – Sep 2020    📍 Pau, France

- M.Sc. in Mathematics (Rank 1, GPA 1.0 ~ Excellent)

Lebanese International University || LIU

📅 Feb 2018 – Aug 2019    📍 Beirut, Lebanon

- Master 1 in Pure Mathematics ( Class Rank 4/15 )

Lebanese University || LU

📅 Oct 2014 – Sep 2015    📍 Beirut, Lebanon

- B.Sc. in Pure Mathematics

Lebanese University || LU

📅 Oct 2008 – Sep 2012    📍 Beirut, Lebanon

## ACHIEVEMENTS

- Received A's in the master's thesis and research internship, and in the following courses at TU Berlin: Numerical methods for PDEs, Scientific Computing, Probabilistic and Bayesian Modelling, and the Seminar in Nonlinear Optimization.
- Received A's in all the required courses in the master's at LIU.
- Scholarship from Region Nouvelle-Aquitaine for excellence in Mathematics to pursue the master's at the University of Pau.
- Ranking first in Number Theory, first year of master at LU

## SKILLS

- **Scientific Skills:**
  - Numerical Simulation    • Numerical Analysis    • PDEs
  - ML    • NN    • Bayesian Inference
  - Calculus of Variations and Optimal Control, Optimal transportation, Nonlinear and Convex Optimization
  - Multi-step methods, Runge-Kutta, Finite Difference, Finite Element, and Finite Volume methods
- **Computing Skills:**
  - Linux    • Python ( tensorflow, numpy, matplotlib )
  - Matlab    • Julia    • C/C++    • OpenMP/MPI
  - Latex    • MS Word/Excel    • VS Code    • SPSS
- **Personal Skills:**
  - Ability to develop strong working relationships
  - Problem Solving    • Adaptability    • Decision Making
  - Fast Learner    • Arabic Romantic Writings    • Football

## MATHEMATICS TEACHER

Teaching mathematics in high schools in English for intermediate and secondary levels.

Private Schools

📅 2012 – 2018    📍 Beirut, Lebanon