

## RELEVANT SUMMARY

Finished a very successful **MSc** with a focus on **Image Processing** and **Deep Learning**. Looking for roles in **Data Science**, **Machine Learning**, and **AI**.

## EDUCATION

<b>Aachen, Germany</b> <ul style="list-style-type: none"><li>MSc in Simulation Sciences, <b>GPA: 1.9</b></li></ul>	<b>RWTH Aachen</b>	<b>Oct 2023</b>
<b>Tehran, Iran</b> <ul style="list-style-type: none"><li>BSc in Mechanical Engineering, <b>GPA: 2.2</b></li></ul>	<b>Sharif Tech</b>	<b>Oct 2016</b>

## RELEVANT SKILLS

### Math

- Applications: **Machine Learning**, **Deep Learning**, **Image Processing**, **Explainable AI**, **Model-Based AI**,
- Fundamentals: **Analysis**, Linear Algebra, Probability, **Optimization**,

### Tech

- Operating Systems UNIX, POSIX, **Linux**, macOS
- Programming Languages: C, **C++**, **Python**, **Bash**, Zsh
- Libraries/Frameworks: **PyTorch**, **TensorFlow**, **Keras**, **Optuna** scikit-learn, Matplotlib, Pandas, NumPy,
- Misc: **HPC**, **Cloud Technologies**

### Soft

- Google-Fu, Indomitable Will, Subliminal Pattern Recognition

## EXPERIENCE

<b>Master Thesis</b>	<b>RWTH Aachen</b>	<b>Oct 2022 – Oct 2023</b>
<p>Deep Unfolding is a new <b>model-based/explainable AI</b> approach in <b>Deep Learning</b> that is gaining traction within the Signal/Image Processing realm. As Phase Problem has lots of applications ranging from X-ray Crystallography, Transmission Electron Microscopy to Coherent Diffractive Imaging; we decided to combine Deep Unfolding with Wirtinger Flow, one of the novel solutions to the phase problem, to bring best of the both worlds together. The non-trivial steps involved:</p> <ul style="list-style-type: none"><li>Mathematical understanding of the phase problem, Wirtinger Flow, and the Deep Unfolding approach.</li><li><b>Model building</b> from scratch using <b>lower-level tensor</b> operations within <b>PyTorch</b>.</li><li>Initialization of the weights/parameters due to the unique nature of the Deep Unfolding approach.</li><li>More in-depth understanding of the available <b>first-order optimizers</b> within <b>PyTorch</b>.</li><li><b>GPU acceleration</b> using the <b>CUDA</b> API.</li><li><b>Hyper-parameter optimization</b> using the Optuna framework.</li></ul>		
<b>Research Assistant</b>	<b>RWTH Aachen</b>	<b>April 2022 – Jan 2023</b>
<ul style="list-style-type: none"><li>Visualization of lattice based structures using the <b>OpenGL</b> API in <b>C++</b> on the <b>RWTH Compute Cluster</b>.</li></ul> <p>I developed an in-house Visualization module to render <b>real-time 3D visualization</b> of lattice based structures using many as much as 60k cylinders in <b>OpenGL</b> for our clients. This required the thorough understanding of <b>Euler angles</b> and how to use them in 4 by 4 transformation matrices on top of the usual <b>Computer Graphics</b> concepts.</p>		
<b>Research Assistant</b>	<b>RWTH Aachen</b>	<b>June 2018 – Jan 2019</b>
<ul style="list-style-type: none"><li>Simulation of the Rarefied Gas Flow Problem in <b>C++</b> on the <b>RWTH Compute Cluster</b>.</li></ul>		