

# MAHMOUD ASLAN

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## EDUCATION

- **MSc COMPUTER SCIENCE FOR AUTONOMOUS SYSTEMS, EÖTVÖS LORÁND UNIVERSITY**  
*2020 - 2023, Budapest, Hungary*
  - Grade: 4.93/5.0 (Excellent)
  - Thesis (Distinction): Extending Sparse Dictionary Learning for Adversarial Robustness, Advisor: András Lőrincz.
  - Key Courses: 3D Computer Vision, Reinforcement Learning, Data Mining, Optimization Methods, Control Theory, Deep Learning.
- **BSc INFORMATICS ENGINEERING, AL-BAAH UNIVERSITY**  
*2013 - 2018, Homs, Syria*
  - Grade: 81.437% (Very Good)
  - Thesis: Improving Network Intrusion Detection using a Denoising Autoencoder with Dropout ([repository](#)), Advisor: Suhel Hammoud.
  - Key Courses: Algorithms & Data Structures, Software Engineering, Database Systems, Artificial Intelligence, Information Theory.

## EXPERIENCE

- **RESEARCH ASSISTANT, NEURAL INFORMATION PROCESSING GROUP, EÖTVÖS LORÁND UNIVERSITY**  
*May 2021 - present, Budapest, Hungary*
  - Research focus: Structured and Convolutional Sparse Coding, Iterative Optimization, Dictionary Learning, Adversarial Robustness in Object Recognition. Advisor: András Lőrincz.
  - Implemented FISTA based sparse networks, studying their behavior under various regularizations to increase the discriminative power of the representation while bridging the gap to theory.
  - Tested different architectural variations by including reconstruction shortcuts between layers to remedy vanishing gradients.
  - Performed extensive empirical studies on Soft Thresholding using sparse, group sparse, and pooled group sparse representations evaluating their robustness against adversarial attacks.
  - Published the results in DeLTA 2022 and contributed the implementations to the group's codebase using Pytorch.
- **PYTHON DEVELOPER, AYLAN**  
*Jan. - Jul. 2019, Remote, Jordan*
  - Collected a dataset of 10,000 Arabic news articles annotated into two classes.
  - Implemented a data preprocessing pipeline to deal with the particularities of the Arabic language.
  - Experimented with different NLP classification models using TensorFlow, the final deployed model reached an accuracy of 88%.
- **WEB DEVELOPER, IT ADVICE**  
*2017 - 2018, Homs, Syria*
  - Worked on three projects using vanilla web technologies focusing on performance. Got recognized by Awwwards.com ([merit](#)).

## PUBLICATIONS

- **Structural Extensions of Basis Pursuit: Guarantees on Adversarial Robustness**, Dávid Szeghy, Mahmoud Aslan, Áron Fóthi, Balázs Mészáros, Zoltán Milacski, and András Lőrincz. *Proceedings of the 3rd International Conference on Deep Learning Theory and Applications - DeLTA, INSTICC. SciTePress, 2022.* [↗](#)

## SELECT PROJECTS

- **Arabic Font Classification**, synthesizing data and addressing domain mismatch challenges, [blog post](#). [↗](#) - 2020
- **Cocat**, a collaborative computer-assisted translation tool, [project preview](#). [↗](#) - 2019
- **Cyclic Learning Rate**, an implementation of the CLR paper, [repository](#). [↗](#) - 2019
- **SubX**, an application to display subtitles over presentations and control them independently, [project page](#). [↗](#) - 2017

## AWARDS & FELLOWSHIPS

- **Nokia Young Scientist Award**, Nokia Bell Labs, Jul. 2023  
Recognition of our research presented at the [36th National Scientific Students' Association Conference \(OTDK\)](#) [↗](#) on Extending Sparse Methods for Robustness, amount: 400,000 HUF.
- **Scientific Students' Association Conference (TDK)** [↗](#) - 1<sup>st</sup> place, Eötvös Loránd University, Dec. 2022  
Extended my master's thesis to include Hard Thresholding with deeper networks and mutual coherence regularization. Our work was nominated to the national conference ([36th OTDK](#) [↗](#)), to be submitted for a journal publication.
- **Graduate Research Fellowships**, Eötvös Loránd University, May 2021 - pres.  
My work with the [Neural Information Processing Group](#) [↗](#) is funded under the following projects: [ELTE-Bosch Scholarship](#) [↗](#), [MOBOT](#) [↗](#), [MILAB](#) [↗](#), and the Thematic Excellence Programme no.: [2020-4.1.1.-TKP2020](#) [↗](#) and [TKP2021-NVA-29](#) [↗](#).
- **Stipendium Hungaricum Scholarship**, Tempus Public Foundation, Sep. 2020 - 2022  
Full, 4-semester, MSc degree scholarship.
- **Digital Arabic Content Competition - 2<sup>nd</sup> place**, Syrian Virtual University, 2019  
Developed a business plan and a prototype for a collaborative computer assisted translation tool using Django, Git, and Docker.
- **Competitive Programming Contestant**, Syrian Collegiate Programming Contest, 2014 - 2015  
Third place and Solid Programmer awards in the local 2014 contest, for more details please check my [ICPC ID](#). [↗](#)

## TECHNICAL SKILLS

- **Proficient:** Python, Pytorch, Scikit-learn, NumPy, Pandas, Matplotlib, SQL, Docker, Git,  $\LaTeX$ .
- **Familiar:** Kubernetes, Kubeflow, MLflow, Seldon, TensorFlow.js.
- **Prior Experience:** Javascript, C++, Java, Django, HTML, CSS.

## LANGUAGES \_\_\_\_\_

- English, C1 [CEFR](#), IELTS overall score: 7.5 (issued Jun. 2019)
- Arabic, Native

## EXTRACURRICULAR & VOLUNTEERING ACTIVITIES \_\_\_\_\_

- [Startup Weekend Homs](#), co-Organizer, 2018
- [TEDxMimasStreet](#), Technical Team Member, 2017
- Al-Baath Collegiate Programming Contest, System Team Member, 2017
- Syrian Collegiate Programming Contest, Site Volunteer, 2016