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# Fares Abawi

<http://fares.abawi.me>

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## PERSONAL INFORMATION

PyTorch | Keras | ROS | MuJoCo | Docker | NumPy | pandas | sklearn

**Nationality & Residence**

Bahrain (resident in Germany)

**Languages**

English (native proficiency), Arabic (native proficiency), German (intermediate proficiency)

## EDUCATION

University of Hamburg, DE

July 2020 - Now

(Expected: July 2024)

### Ph.D. Computer Science

My research is focused on predicting social attention in dynamic settings & understanding the influence of robot gaze & social cues on humans by conducting user studies. I explore different neural techniques to integrate non-verbal social cues through late & early fusion.

University of Hamburg, DE

October 2016 - April 2019

German Jordanian University, JO

September 2011 - August 2016

Darmstadt Univ. of Appl. Sc., DE

March 2015 - February 2016

### M.Sc. Intelligent Adaptive Systems (Computer Science)

Courses: Human-Computer Interaction, Neural Networks, Bio-inspired AI, Machine Learning & Speech Signals

### B.Sc. Communication Engineering

Courses: Analog/Digital Electronics, Electromagnetics, Signal Processing, Networks, Embedded Systems & OOP

### B.Eng. Electrical Engineering and Information Technology - Exchange Student

1-year scholarship from the German Academic Exchange Service (DAAD) for achieving the *highest academic merits*

## PROFESSIONAL EXPERIENCE

University of Hamburg, DE

April 2020 - Now

### Research Associate @ Knowledge Technology Group

Developed neural attention models for multimodal scanpath & saliency prediction, implemented on robots:

- [Simulated & physical robot actuation \(iCub & Pepper\)](#) using YARP & ROS
- [Audiovisual multimodal integration for modeling social attention](#) using PyTorch
- [Cognitive simulation for emulating human-like crossmodal \(audiovisual\) conflict on a robot](#)

Smartmicro GmbH, DE

May 2019 - April 2020

### Algorithm Engineer @ Tracking and Sensor Fusion Group

Developed neural models for traffic and automotive radar signal processing:

- ROS multi-camera + radar calibration & fusion for multi-object tracking
- Sequential radar signal classification & trajectory estimation using PyTorch & sklearn
- CD & MLOps pipelines with Jenkins & Docker

University of Hamburg, DE

December 2017 - March 2019

### Research Assistant @ Knowledge Technology Group

Developed visuomotor grasping models & language models:

- [Robotic simulation for object grasping](#) using MuJoCo
- [Computer vision for object detection & grasping](#) using Keras
- [Language modeling with surprisal-based activation](#) using Keras & Tensorflow

Harman International, DE

September 2015 - February 2016

### Internship: Speech Interaction Systems @ Spoken Dialog System Group

Developed application concepts for a spoken dialog system:

- Grammar parsing tool in Java, XML & XSLT
- Speech engine integration (Ivona text-to-speech & Nuance speech recognizer) in C++

German Jordanian University, JO

July 2014 - September 2014

### Internship: Scheduling Automation @ Information Systems and Technology Center

[Developed a graph coloring optimization-based exam scheduling system using AMPL](#)

## PROJECTS

University of Hamburg, DE

October 2018 - April 2019

### M.Sc. Thesis: Intermediate Representations in Deep Multimodal Neural Networks

[Developed a multimodal/multitask neural network for goal-oriented grasping:](#)

- Data processing and filtration using NumPy & pandas
- Developing object grasping models with images & linguistic description as input built with Keras
- Robot simulation & inverse kinematics using MuJoCo
- 3D object augmentation in real scenes using OpenGL

University of Hamburg, DE

October 2017 - April 2018

### M.Sc. Project: Designing a Personality-Driven Robot for an HRI Scenario

[Developed the spoken dialogue system for a robotic interaction experiment:](#)

- Designing a frame-based dialog system with mixed-initiative
- Speech & language engine integration (SpaCy, MITIE, Amazon Polly & Google Speech)
- Speech signal processing & language modeling

German Jordanian University, JO

February 2014 - February 2015

### B.Sc. Thesis: Alerting Sounds Detection, Classification, and Localization for Assisting

**People with Hearing Disabilities**

[Developed an alert-sound classification \(support vector machines\) & localization system \(TDOA\):](#)

- Construction of a hardware prototype with microphone arrays
- C#, C & Matlab development of localization prototypes
- Code development on Windows Phone, BeagleBone & Arduino
- Speech signal processing & feature engineering

## Open Source

[Wrapyfi](#): Python wrapper for multi-middleware support including ROS/2, YARP & ZMQ with deep learning plugins

[Llama + Wrapyfi](#): Distributing the Llama LLM on multiple machines using Wrapyfi

[ImageBind LoRA](#): Fine-tuning a crossmodal embedding model using Low-Rank adaptation

## SELECTED PUBLICATIONS

Full list on <https://fares.abawi.me/publications>

[1] F. Abawi, D. Fu, and S. Wermter. "Unified Dynamic Scanpath Predictors Outperform Individually Trained Neural Models," *arXiv.2405.02929*, 2024.

[2] F. Abawi, P. Allgeuer, D. Fu, and S. Wermter. "Wrapyfi: A Python Wrapper for Integrating Robots, Sensors, and Applications across Multiple Middleware," in Proceedings of *The ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 2024. Related code: <https://github.com/fabawi/wrapyfi>

[3] M. Kerzel\*, F. Abawi\*, M. Eppe, and S. Wermter. "Enhancing a Neurocognitive Shared Visuomotor Model for Object Identification, Localization, and Grasping With Learning From Auxiliary Tasks," in *IEEE Transactions on Cognitive and Developmental Systems*, 2022. Related code: [https://github.com/knowledgetechnologyuhh/augmented\\_grasping\\_3d](https://github.com/knowledgetechnologyuhh/augmented_grasping_3d)

[4] F. Abawi, T. Weber, and S. Wermter. "GASP: Gated Attention for Saliency Prediction," in Proceedings of *The International Joint Conference of Artificial Intelligence (IJCAI)*, 2021. Related code: <https://github.com/knowledgetechnologyuhh/gasp>