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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

**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. I explore different neural techniques to integrate non-verbal social cues through late & early fusion

*University of Hamburg, DE*

October 2016 - April 2019

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

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

*German Jordanian University, JO*

September 2011 - August 2016

**B.Sc. Communication Engineering**

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

*Darmstadt Univ. of Appl. Sc., DE*

March 2015 - February 2016

**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 tools 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**. 3D augmentation (AR) in real scenes using **OpenGL**
- Developing object grasping models with images & linguistic description as input built with **Keras**
- Robot simulation & inverse kinematics using **MuJoCo**

*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-middlewares 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, 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>

[2] 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>

[3] M. Mohammadi, N. Xirakia, F. Abawi, and others. "Designing a personality-driven robot for a human-robot interaction scenario," in Proceedings of *The IEEE International Conference on Robotics and Automation (ICRA)*, 2019.

[4] T. Alpay, F. Abawi, and S. Wermter. "Preserving activations in recurrent neural networks based on surprisal," *Neurocomputing*, 2018.