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Fares Abawi

https://fares.abawi.me

fabawi
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Framework Expertise: **PyTorch | Keras | ROS | ZMQ | MuJoCo | NumPy | pandas | sklearn | Docker | Jenkins**

Education

University of Hamburg, DE
Ph.D. Computer Science
July 2020 - Expected: September 2024

University of Hamburg, DE
M.Sc. Intelligent Adaptive Systems (Computer Science)
October 2016 - April 2019

German Jordanian University, JO
B.Sc. Communication Engineering
September 2011 - August 2016

Darmstadt University of Applied Sciences, DE
B.Eng. Electrical Engineering and Information Technology - Exchange Student
March 2015 - February 2016
1-year scholarship from the German Academic Exchange Service (DAAD) for outstanding academic achievements.

Professional Experience

University of Hamburg, DE
Research Associate @ Knowledge Technology Group
April 2020 - Now

- *Research focused on predicting social attention in dynamic settings, as well as understanding the influence of robot gaze & social cues on humans by conducting user studies.*
- *Developed neural attention (early fusion & late integration) models for multimodal scanpath & saliency prediction, embodied in robots.*
- *Developed an audiovisual social cue integration model for social attention prediction using PyTorch.*
- *Developed a cognitive simulation model for emulating human-like crossmodal (audiovisual) conflict on a robot.*

***Skills**: Simulated & physical robot actuation (iCub & Pepper) using YARP & ROS. Teaching, presentation, & academic writing.*

Smartmicro GmbH, DE
Algorithm Engineer @ Tracking and Sensor Fusion Group
May 2019 - April 2020

- *Developed neural models for traffic & automotive radar signal processing.*
- *Developed a novel technique ROS multi-camera + radar calibration & fusion for multi-object tracking.*

***Skills**: Sequential radar signal classification & trajectory estimation using PyTorch & sklearn. CI/CD & MLOps pipelines with Jenkins & Docker.*

University of Hamburg, DE
Research Assistant @ Knowledge Technology Group
December 2017 - March 2019

- *Developed visuomotor robot grasping models & computer vision models.*
- *Developed a Language model with surprisal-based activation using Keras & TensorFlow.*

***Skills**: Robotic simulation using MuJoCo. Computer vision for object detection & grasping using Keras. Language modeling with TensorFlow.*

Harman International, DE
Internship: Speech Interaction Systems @ Spoken Dialog System Group
September 2015 - February 2016

- *Developed application concepts for a spoken dialog system.*

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

German Jordanian University, JO
Internship: Scheduling Automation @ Information Systems and Technology Center
July 2014 - September 2014

- *Developed a graph coloring optimization-based exam scheduling system using AMPL.*

***Skills**: Mathematical programming with AMPL. Frontend development with JAVA servlets, HTML, & CSS.*

Projects

University of Hamburg, DE
M.Sc. Thesis: Intermediate Representations in Deep Multimodal Neural Networks
October 2018 - April 2019

- *Developed a multimodal/multitask neural network for robot grasping.*
- *Developed object-grasping models with images & linguistic descriptions as input built with Keras.*

***Skills**: Data processing & filtration using NumPy & pandas. Robot simulation & inverse kinematics using MuJoCo. 3D object augmentation using OpenGL.*

University of Hamburg, DE
M.Sc. Project: Designing a Personality-Driven Robot for an HRI Scenario
October 2017 - April 2018

- *Developed the spoken dialogue system for a robotic interaction experiment.*
- *Designed a frame-based dialog system with mixed-initiative.*

***Skills**: Speech & language engine integration (SpaCy, MITIE, Amazon Polly, & Google Speech) in Python. Speech signal processing & language modeling.*

German Jordanian University, JO
B.Sc. Thesis: Alerting Sounds Detection, Classification, and Localization for Assisting People with Hearing Disabilities
February 2014 - February 2015

- *Developed an alert-sound classification (support vector machines) & localization system (TDOA).*
- *Constructed a hardware prototype with microphone arrays for localizing sound.*
- *Implemented localization algorithms on the Windows Phone, BeagleBone, & Arduino.*

***Skills:** C#, C, & Matlab development of localization prototypes. Speech signal processing & spectral feature engineering.*

Open Source Projects

- ***Wrapyfi:** Python wrapper for multi-middleware support, including ROS/2, YARP, & ZMQ with deep learning plugins.*
  https://github.com/fabawi/wrapyfi
- ***Llama + Wrapyfi:** Distributing the Llama LLM on multiple machines using Wrapyfi.*
  https://github.com/modular-ml/wrapyfi-examples_llama
- ***ImageBind LoRA:** Fine-tuning a crossmodal embedding model using Low-Rank adaptation.*
  https://github.com/fabawi/ImageBind-LoRA

Selected Publications

(Full list on fares.abawi.me/publications)

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

***Abawi, F.**, Allgeuer, P., Fu, D., and Wermter, S. "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.*

***Abawi, F.**, Weber, T., and Wermter, S. "GASP: Gated Attention for Saliency Prediction," Proceedings of The International Joint Conference of Artificial Intelligence (IJCAI), 2021.*