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Fábio Ferreira

Curriculum Vitae

Person

Place of birth	Calw, Germany
Citizenships	German and Portuguese
Date of birth	17th of April 1990

Education

10/2016–present **M. Sc. in Computer Science**, *Karlsruhe Institute of Technology*, in Karlsruhe, *current GPA: 3.8*.
Focus: Machine Learning

2013-2016 **B. Sc. in Computer Science**, *Karlsruhe University of Applied Sciences*, in Karlsruhe, *GPA: 3.8, with distinction (graduated as one of the top 8% in two years)*.
Focus: Software Engineering, Computer Vision

2010-2012 **State-Certified Technical Engineer**, *Advanced training, Gottlieb–Daimler–Schule 2 – Fachschule für Technik*, in Sindelfingen, *GPA: 3.9 (graduated best in class)*.
Electrical Engineering, Computer Science

2006-2009 **IT systems engineer**, *Apprenticeship, Deutsche Telekom AG*, in Stuttgart.
Information Processing

Research

11/2017–present **Non-parametric density estimation with Neural Networks for estimating conditional probability densities in the financial sector (working title)**, *Fábio Ferreira, Jonas Rothfuss*.

2016–2017 **Deep Episodic Memory: Encoding, Recalling, and Predicting Episodic Experiences for Robot Action Execution**, *Fábio Ferreira, Jonas Rothfuss, You Zhou, Dr. Eren E. Aksoy, Prof. Dr. Tamim Asfour*, pre-print, Abstract:.

Action understanding is an important cognitive faculty which can help robots efficiently encode, store, and retrieve observed human demonstrations. This is of great interest in cognitive robotics for creating memory units to encapsulate gained information from past experiences, which can be then recalled to adapt ongoing and future behaviors. We introduce a novel deep neural network architecture for encoding, storing, and recalling past action experiences in an episodic memory-like manner. The network creates a low-dimensional latent space representation of the observed actions. Such a formulation in the latent space allows robot to classify different action types and retrieve the most similar episodes to the query action. The proposed deep network further helps robots predict and generate the next possible frames of the currently observed action.

Link https://arxiv.org/abs/1801.04134

Bachelor Thesis

Title ***Optimal CNN Architectures for Defect Classification in Images***

Supervisors Prof. Dr. Norbert Link, Prof. Dr.-Ing. Laubenheimer

Description The thesis addressed the use of Convolutional Neural Networks (CNN) for defect classification in the automatical visual inspection. To minimize time-consuming and expensive efforts when training such, methods were evaluated that allow to choose an optimal architecture from a set of architectures within a reasonable amount of time. Predominantly, the effect of leaving a subset of an architecture's layers (mainly feature extraction layers) in its initialized state has been analyzed. The realization of this work included the extensive use of the Caffe Deep Learning framework and the behavior of different state-of-the-art DNN architectures (e.g. VGG, ResNet) under the mentioned assumption.

Scholarships

12/2017–05/2018 **e-fellows Computer Science Scholarship**, *Financial and mentorial sponsorship received by the IT and business consulting corporation Capgemini. The scholarship aims to further develop the scholar's technical skills and it allows to establish contacts with industry companies through the participation in workshops and close mentoring.*.

2015–present **German Academic Scholarship Foundation**, *Admission in November 2015, suggested by the university for exceptional student performance*, https://ferreirafabio.github.io/data/sdv.pdf.

Work Experience

10/2017–present **Research Assistant**, *High Performance Humanoid Technologies Lab*, Karlsruhe Institute of Technology.

I do research and advise staff in Deep Learning and TensorFlow-related questions

2013–present **Working Student**, *MBtech Group GmbH & Co. KGaA*, Sindelfingen.

Software development, responsible for tools and scripts used by 30 engineers

2012–2013 **Software Developer**, *MBtech Group GmbH & Co. KGaA*, Sindelfingen.
Software development in exhaust aftertreatment for Daimler AG, using Matlab/Simulink and Daimler tools

2010–2010 **Network Administrator**, *Sparkassen-IT GmbH & Co. KG*, Calw.
Configuration of Cisco Systems network devices, Linux server administration

Other Achievements

09/2017 **HackX 2017 Hackathon**, *Cologne, Germany, Microsoft Headquarters*, Tree-based representation of news articles based on Microsoft Azure Cognitive Services - Prototype created during the hackathon (sponsors: Microsoft, Handelsblatt, FlowFact), awarded for the best innovation and best pitch, https://www.hackathon.com/event/hackx—artificial-intelligence-hackathon-2017-36159341564.

03/2017 **StartHack 2017 Hackathon**, *St. Gallen, Switzerland, University of St. Gallen*, Participated in an AI challenge by Deutsche Bank at the StartHack Hackathon which was held in St. Gallen. Our team implemented a coupon recommendation prototype based on bank account expenses. The application recommends vouchers based on your bank account expenses and current location, so that when purchases are detected on the credit card, a suitable voucher will be provided the next time the customer logs into his Deutsche Bank account, https://starthack2017.devpost.com.

11/2016 **Speaker at the Deep Learning Student Talk**, *Karlsruhe University of Applied Sciences*, Both Prof. Link and Prof. Laubenheimer invited me as a speaker (along with two other alumni) to the first Deep Learning Student Talk with approximately 50 attendees. During the 60 minute presentation, I gave an introduction to the basics of Deep Learning and provided insights into my bachelor thesis results, https://ferreirafabio.github.io/data/posterdl.pdf.

Machine Learning Skills

Frameworks and Platforms: TensorFlow, Caffe, OpenCV, scikit–learn, Amazon Web Services, Microsoft Azure

Knowledge: Deep Learning for Computer Vision, Inductive, deductive, generative and discriminative learning, hypothesis space theory, Bayesian inference theory, VC–dimension theory, decision trees, SVM, Reinforcement Learning, Automatic Speech Recognition (ASR), basics of Natural Language Processing (NLP)

Models: CNN, RNN/LSTM, Auto–Encoders, MDP, HMM, Markov Logic Network, Deep Belief Networks, Restricted Boltzmann Machines

Software Language Skills

Language	Level	Experience
Python	practitioner	2 years
Java	practitioner	3 years
Matlab	practitioner	3 years
C/C++	experienced beginner	2.5 years
SQL	beginner	1 year
C#	beginner	1 year

Software Skills

Development	Eclipse SDK, PyCharm, Matlab, Simulink
Testing	The MathWorks Polyspace, Tessy Test

Languages

German	IRL level 5
English	IRL level 4
Portuguese	IRL level 4
Spanish	IRL level 1

Interests

Reading	Besides working and studying, I use a considerable amount of my available time for reading books.
Sports	I play volleyball in a society and enjoy hiking in the alps and Black Forest region.
Politics	I am Interested in both national and international politics and enjoy political discussions at the German Academic Scholarship Foundation.