Jonas Faßbender

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Research Interests

I am currently interested in Machine Learning, especially focused on Conformal Prediction, predicting with certainty and how to implement Machine Learning models efficiently.

Education

2016 - 2019 (Expected) — BSc Computer Science, Technical University of Cologne.

Relevant Projects:

- Partial Classification Forest: A Monte Carlo based Meta Classifier for Supervised Learning. My first contact with the idea of predicting with certainty. Led my to Conformal Prediction. I intent to write my Bachelor Thesis about this topic.
- Monte Carlo Localization: Part of the Artificial Intelligence course. We localized a LEGO EV3 robot in known surroundings using a Particle Filter.
- Ray Tracing Shader: I ported Keenan Crane's implementation[1] of a Ray Tracing Shader that renders a four dimensional Julia Set to Unity3D (ShaderLab) and WebGL2/WebAssembly (OpenGL 3.0). Both implementations add animations to the rendering of the Julia Set.
- An architecture for distributed Reinforcement Learning: Technologies we used were Keras (on Tensorflow), OpenAI Gym and RabbitMQ.
- A distributed system for the IoT: We built a peer-to-peer network of sensor servers communicating over a custom protocol. Implemented on RaspberryPis, written in C.
- A visualization tool for graph algorithms: This tool visualizes how paths are chosen by Dijkstra's shortest path and the A* algorithm. Both are implemented with a Priority Queue based on a Binary Heap.
- A wine classifier: A Neural Network that classifies a wine dataset. Built with Neuroph/Neuroph Studio.

Modules studied include: Algorithms, Artificial Intelligence, Discrete Mathematics/Cryptography, Distributed Systems, Software Engineering and Theoretical Computer Science.

2013 - 2015 — A Levels, Herkenrath Upper School. Intensified courses were English and Geology.

[1] https://www.cs.cmu.edu/~kmcrane/Projects/QuaternionJulia/paper.pdf

Professional Experience

2018 - now	Data Scientist and Programmer, RLE International. Mostly Image, Text Recognition and Data Sanitation tasks. We also work within the domain of Computer Graphics (mesh-based CAD formats and parsing tools).
2015 - 2016	Small Business System Administrator, Lieb EDV Beratung. Main focus were Backup Systems and Windows Server administration for several small businesses.

Technologies

Programming languages	Python, Rust, JavaScript, C, C#, Go, Bash, Elm, Lua, Prolog, Java
Machine Learning libraries and frameworks	scikit-learn, Keras, OpenAI Gym, Tesseract-OCR, Unity3D's AI API, Neuroph/Neuroph Studio
Distributed and parallel programming	POSIX Threads, RabbitMQ, Apache Kafka, tokio-rs
Visualization and graphics	HTML, CSS, tikz, Matplotlib, Unity3D, WebGL2, OpenGL 3.0
Others	LaTeX, Git, Numpy, Node.js, OpenSUSE (Linux), SQL, PL/SQL, UML

Languages

German (native)

English (C1)

Memberships

IEEE - Student Member

IEEE Computational Intelligence Society - Student Member

Interests

I enjoy sports, especially basketball. On my vacations I go camping and hiking. I like to render mathematical constructs and animations, for me they are aesthetically very pleasing. On my website, fassbender.dev, you can see either a Lindenmayer-System or an animation showing different four dimensional Julia Sets reduced to three dimensions, depending on your device and browser. I also enjoy contemporary and classic literature, fiction and non-fiction alike. Furthermore I eat very spicy food and grow my own chilies.