Thomas Haferlach

Contact

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Profiles

LinkedIn GitHub SoundCloud Artist Page

Work Experience

5/2018

Machine Learning Engineer at **Pixtunes**

Berlin, Germany

Transformed machine learning at Pixtunes from a one-man hacklab to a department involving multiple engineers and data scientists. I conceived and implemented a sophisticated generative system based on *Autoencoders* and *Generative Adversarial Networks*. By training specialist models on individual instruments We are attempting to develop an algorithmic orchestra.

9/2018

Foresight Researcher at **Envisioning**

Remote

Researched future trends of Artificial Intelligence for the World Government Summit in Dubai drawing on academic papers, news and science fiction.

Subsequently investigated technologies that will impact sustainability in the medium- and long-term future for the GIZ (Deutsche Gesellschaft fuer Internationale Zusammenarbeit) in Germany.

5/2018 till 6/2018

Talk about Artificial Intelligence and Art at the Frontiere IA Conference at **MUTEK & Frontière IA**

Montreal, Canada

Conceived the live visuals for the band "Die Wilde Jagd" by creating a system that visualizes audio using Deep Neural Networks. Subsequently got invited to give a talk on applications of AI with art at the Frontière IA conference in Montreal

3/2018 till 3/2018

Machine Learning and Music Hacklab: Swarm Animism at **transmediale - art & digital culture**

Berlin, Germany

Conceived and performed a musical piece which used the smartphones of the attendees to listen and react by generating sounds. This resulted in a form of musical swarm intelligence which blurs the border between performer and participant.

1/2010 till 12/2018

Artist and Organizer at **Voodoohop**

São Paulo, Brazil

As one of the founders of the multidisciplinary art collective Voodoohop, I became deeply involved with the art and music scene of São Paulo and Brazil. Guided by the principle of stimulating individual and joint freedom of expression, Voodoohop is enjoying international success with performances at events all over Europe, the USA, South America and a sold out physical release in Japan.

As a musician, I have created a unique live performance in which software I developed is responsible for generating harmony, melody and modifying the musical arrangements in real time.

3/2008 till 3/2016

Freelance Developer at **SuperUber (Rio de Janeiro), Conception (Rio de Janeiro), TIM (São Paulo), ArtRio, City of São Paulo**

Brazil

Developed a range of interactive installations using technologies including machine learning, computer vision, distributed computing, sensors and data visualization.

1. With the help of facial tracking, a microphone and pitch analysis, participants could paint on a blank canvas using their voice and head movements.
2. An OpenGL based climbing game in which a user climbs a mountain using the movement of his own hands
3. For the 2014 FIFA World Cup, using real-time image augmentation, participants took selfies with the official mascot superimposed.

6/2007 till 10/2007

Research and publication of my bachelor thesis at **The University of Edinburgh**

Edinburgh, United Kingdom

Implementation of my thesis Evolving a Neural Model of Insect Path Integration on a physical robot and publication in the journal "Adaptive Behavior"

10/2006 till 2/2007

Software Engineer at **Amazon Development Centre Scotland**

Edinburgh, United Kingdom

Agile development of backend tooling, A/B testing and data mining for sales optimization.

Technologies: Java, Spring Framework, Test-Driven Development, Agile Development, Python, Distributed Computing

8/2004 till 7/2005

Software Engineering Internship at **Sun Microsystems**

Portland, Oregon

Worked as a team developer on several inner process projects.

Researched and developed a prototype failure analysis classification engine using technologies from the field of data mining and machine learning.

Technologies: Java, Text Classification, Agile Development

Education

1/2001 till 1/2006

The University of Edinburgh: Artificial Intelligence and Computer Science

Bachelor of Science with *First class honors*

Modules: Artificial Intelligence, Computer Science, Mathematics, Physics, Advanced Vision, Computational Complexity, Intelligent Autonomous Robotics, Modelling and Simulation, Visualization, Neural Computation

Extra: French, Human Communication

Thesis: Evolving Neural Models of Path Integration

1/1995 till 1/2001

Albert Schweitzer Gymnasium, Kassel

Abitur with grade 1.7

Publications

1/2009

Low Level Approaches to Cognitive Control B. Webb, J. Wessnitzer, H. Rosano, M. Szenher, M. Zampoglou, T. Haferlach, P. Russo

Spatial Temporal Patterns for Action-Oriented Perception in Roving Robots (book)

We describe several neural network implementions of insect based methods of navigation. We present the preliminary results of modelling associative learning capabilities based on the insect mushroom bodies.

3/2007

Evolving a Neural Model of Insect Path Integration T. Haferlach, J. Wessnitzer, M. Mangan & B. Webb

Adaptive Behaviour 15(3)

We use a genetic algorithm to evolve a novel neural model of path integration, based on input from cells that encode the heading of the agent. We demonstrate the capabilities of the network under noisy conditions in simulation and on a robot.

Awards & Projects

11/2018

Traverse - A Virtual Reality Journey through the Origins of Language - Spatialized Sound Design

Designed the spatialized soundscape and musical score for the "Traverse" VR experience funded by Google Jump Start.

1/2017

Harmonic Audio Mixing Visualization Tools

Open-source project: An innovative way of analyzing and visualizing musical harmony using colors, waveforms and the harmonic circle. Technologies: React - Max/MSP - Ableton Live - Electron - Node.js

6/2007

Simulated Car Racing Competition (2nd Place) / **IEEE Congress on Evolutionary Computation**

Trained a modular neural network architecture to control an agent that competed successfully in the IEEE CEC Simulated Car Racing Competition.

5/2001

Honorary Membership / **German Physics Society**

Languages

English (Native speaker) **German** (Native speaker) **Portuguese** (Full professional) **French** (Basic conversational)

Skills

Software Engineering: Agile Development, OOP and Functional Programming, Distributed Computing, Full Stack Development, Java, Javascript, Typescript, Python, SQL, NoSQL, Git, Node.js, Max/MSP, Audio Classification, Digital Signal Processing, Web Crawling, Digital Audio Workstations

Machine Learning: Tensorflow, PyTorch (basic), Amazon Web Services, Neural Computation, Generative Models, Modelling and Simulation, Data Processing Pipelines, Data Visualization, Applying academic research in practice

Soft Skills: Working independently, Conveying technical information to a non-technical Audience, Logical thinking and problem solving, Excellent written and oral communication skills