Johann Gerberding

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Education

- **Technische Universität Braunschweig** — Braunschweig, Germany
  Master of Science - Industrial Engineering and Management — *October 2015 - September 2018*
  Courses: *Intelligent Data Analysis, Production Management*
- **Private Hochschule für Wirtschaft und Technik** — Diepholz, Germany
  Bachelor of Engineering - Industrial Engineering and Management — *August 2011 - May 2015*

Skills

- **Languages**: Python, C++, SQL, Bash, HTML, CSS
- **Frameworks**: PyTorch, OpenCV, albumentations, Pillow, Pandas, HuggingFace, SpaCy, FastAPI, Django, Flask
- **Tools**: Git, PostgreSQL, Docker, SQLite
- **Platforms**: Linux, Mac, Windows
- **Soft Skills**: Writing, Public Speaking

Experience

- **Scientific Researcher - Applied Artificial Intelligence**
  Department of Business Informatics - University of Oldenburg — *December 2019 - today*
  - **DigiSchwein - Sow Health Monitoring**: Work in Progess: Detect sow and classify its posture (lying-site, lying-abdominal, standing, sitting) and activity (idle, eating, drinking). Analyze the behavior over time and work on a evaluation approach with domain experts / veterinarians.
  - **DigiSchwein - Piglet Birth Monitoring**: Work in Progess: Detect and count birth events in videos using different deep learning approaches (2D-Detection + Classification, 3D-Convolutions + Classification, Transformer).
  - **DigiSchwein - Activity Monitoring of Pigs**: Combined the ByteTrack with a Pose Estimation (HRNet-Lite) and a Posture Classification (EfficientNet B-0) model to analyze the activity level in a pig barn which gives you insights about their health and aggression levels.
  - **DigiSchwein - Real-time animal tracking**: Trained YOLOv5 on pig detection and combined it with SORT and ByteTrack tracking algorithms for real-time animal tracking.
  - **TaDeA - REST API for Named Entitiy Recognition**: Work in Progess: Create a API for a custom NER pipeline using HuggingFace (BERT) and FastAPI. Creation of a domain specific dataset.
  - **TaDeA - REST API for Document Layout Detection**: Prototyping / Work in Progress: Trained YOLOv5 and Faster-RCNN models on Document Layout Detection task for contracts and transfer pricing documentation (pretraining on multiple Open Source datasets, finetuning on domain specific dataset) and deployed a simple prototype with FastAPI.
  - **TaDeA - PostgreSQL Data Warehouse**: Worked with two colleagues on creating a data warehouse using PostgreSQL and implemented parsing and import scripts for different Excel and JSON files containing information about companies and employees.
  - **PROPOSE.AI - Recommendation Engine for glasses**: Implemented a deep convolutional autoencoder using PyTorch to reduce dimensions of product images for clustering (tested different clustering algorithms, evaluation was very challenging). I added a simple heuristic for navigating through the clusters based on the cluster centers.
- **Scientific Researcher**
  BIBA - Bremer Institut für Produktion und Logistik — *Feb 2019 - Dec 2019*
  - **Binntelligent**: Worked on a system based on a Recurrent Neural Network (LSTM) to predict arrival times of inland vessels based on time series data.
  - **Mittelstand 4.0 - Kompetenzzentrum Bremen**: Conceptual design and implementation of business modeling workshops.
- **Consultant - Factory Planning**
  MR PlanFabrik GmbH — *Sep 2018 - Feb 2019*
  - **Factory Layout Design**: Conducting a value stream mapping and redesign of the factory layout of a medium-sized industrial company.
  - **Simulation study in the field of material supply**: Preparation of a simulation study for the planning of material supply for an international bus manufacturer using PlantSimulation.

Projects

- **Johanns Blog - Machine Learning**: My personal blog where I write about interesting Machine Learning related topics. Tech: Hugo, Github Pages. (Work in Progress)
- **comma10k - Semantic Segmentation Challenge**: Open source, from scratch paper implementation of the RegSeg model for semantic segmenation to tackle the comma.ai semantic segmentation challenge. Comparison with UNet++ and DeepLabV3+ implementations (framework: pytorch-segmentation-models). Tech: Python, PyTorch, pytorch-segmentation-models, albumentations (March 2022)
- **Paper Implementations - Reinforcement Learning**: Research oriented, open source, implementation and training of multiple popular Deep Reinforcement Learning algorithms (REINFORCE, Deep Q-Networks, A2C). Tech: Python, PyTorch, OpenAI gym (February 2022)
- **Paper Implementation - Vanilla Transformer**: Research oriented, open source, implementation of the Transfomer model presented by Vaswani et al. in 2017, including an easy gradio web app for demonstration. Tech: Python, PyTorch, gradio (December 2021)
- **Paper Implementation - Neural Machine Translation by Jointly Learning to Align and Translate**: Research oriented, open source, implementation of the RNNsearch model presented by Bahdanau et al. in 2016. Tech: Python, PyTorch (November 2021)

Publications

- **Evaluation of Deep Learning Instance Segmentation Models for Pig Precision Livestock Farming**: 24th International Conference on Business Information Systems (BIS 2021) - July 2021
- **Analyzing different material supply strategies in matrix-structured manufacturing systems**: Procedia CIRP - June 2019

Qualifications

- Natural Language Specialization - Coursera (December, 2020)
- Deep Learning Specialization - Coursera (June, 2019)