

# Johann Gerberding

Blog: [johanngerberding.github.io/](https://johanngerberding.github.io/)

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## EDUCATION

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

## SKILLS

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

## EXPERIENCE

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- **Software Developer - Machine Learning**  
*NeXat GmbH* October 2022 - today
- **Scientific Researcher - Applied Artificial Intelligence**  
*Department of Business Informatics - University of Oldenburg* December 2019 - October 2022
  - **DigiSchwein - Sow Health Monitoring:** Work in Progress: 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 Progress: 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 Entity Recognition:** Work in Progress: 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

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- **Johanns Blog - Machine Learning:** My personal blog where I write about interesting Machine Learning related topics. Tech: Hugo, Github Pages. (Work in Progress)
- **Paper Implementation - Vision Transformer:** Open source, from scratch paper implementation of the Vision Transformer (ViT). Tech: Python, PyTorch, albumentations (June 2022)
- **comma10k - Semantic Segmentation Challenge:** Open source, from scratch paper implementation of the RegSeg model for semantic segmentation 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 Transformer 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

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- **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

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- Natural Language Specialization - Coursera (December, 2020)
- Deep Learning Specialization - Coursera (June, 2019)
- Generative Adversarial Networks (GANs) Specialization - Coursera (April, 2022)