

Nicholas Abad

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Personal Statement:

As a current **Junior Machine Learning Engineer** at Alexander Thamm GmbH in Cologne, Germany and as a **MSc Data Science** graduate from Lancaster University in the United Kingdom, I am seeking an opportunity to use my extensive statistical and machine learning knowledge to conduct biomedical research within breast cancer as a PhD student.

Core Skills:

- **Python** (7 years of experience): TensorFlow (1.x and 2.x), Keras, Pandas, NumPy, Scikit-Learn
- **R** (4 years of experience), **Java** (1.5 years of experience), **SQL** (1 year of experience)
- Theoretical and practical knowledge in all phases of the data science pipeline from **exploration** using notebooks to **model building** with Keras and Tensorflow to **deployment** at scale
- Advanced knowledge in **statistical topics** such as maximum likelihood estimations, Bayesian statistics (hierarchical modeling, Monte Carlo Markov Chains, Gibbs Sampling), and reinforcement learning
- Functional experience with Docker, Kubernetes, and Nginx with Flask
- Consistently write clean and re-usable code adherent to PEP8, MyPy, and Flake8 style guides

Education:

M.S. in Data Science at Lancaster University

Oct 2017 – Sep 2018

Graduated with Distinction (highest academic honors)

Master's Dissertation Title: *“Improving Motor Insurance Modeling Using Parametric and Non-Parametric Modeling Techniques with Hyper-Parameter Optimization”*

Main Topics Researched: XGBoost, Bayesian Optimization with Gaussian Process Upper Confidence Bound (GP-UCB), SMOTE, Tomek Links, ElasticNet Regression, LASSO Regression, Random Forests

Selected Modules/Classes:

- **Bayesian Inference / Likelihood Inference**
Topics Covered: Posterior/Prior/Conditional/ Predictive Distributions, Gibbs Sampler, Change-point Models, Monte Carlo Markov Chains, Metropolis-Hastings Algorithm (Independence Sampler / Random-Walk Metropolis)
- **Distributed Artificial Intelligence:**
Topics Covered: Single / Multi-Agent Reinforcement Learning, MDPs / POMDPs, Game Theory, Ensembles
Final Project: Implementing Monte Carlo Tree Search (Reinforcement Learning) within a board game
- **Data Mining**
Topics Covered: Logistic Regression, SVMs, and Clustering Techniques, Neural Networks
Final Project: Classifying the Date of RGB Images Using Convolutional Neural Networks and k-means Clustering
- **Applied Data Mining / Natural Language Processing**
Topics Covered: Data Scraping, Tokenization, Annotation, Tf-Idf
Final Project: Created a web-scraper to obtain lyrics and analysed individual album lyrics for artist classification

B.S. in Mathematics, Computer Science minor at the University of San Francisco

Aug 2012 – May 2016

- Member of the University's honorary mathematics society Pi Mu Epsilon
- Relevant Courses Include Statistics, Probability, Data Mining, Linear Algebra, and Econometrics

Key Work Experience:

Alexander Thamm GmbH (Cologne, Germany)

Jan 2020 – Present

Junior Machine Learning Engineer

- Created from scratch our company's first ever product, which was a sales forecasting application, using Flask and Plotly Dash as our deployment and user interface, and used Python to implement algorithms such as Prophet (Bayesian forecasting method by Facebook), Convolution Neural Networks, and Recurrent Neural Networks
- Assisted in the creation of a pipeline process using Kubeflow and the implementation of Convolution Neural Networks to classify a patient as being healthy, positive for COVID-19, Pneumonia, and/or other diseases using their x-ray images
- Researched and documented the benefits and drawbacks of 8 machine learning platforms (AWS Sagemaker, Azure Databricks, Kubeflow with MLflow, etc.) to create an easy-to-use scoring system based on exploration, pipelines, model management, deployment, batch inference jobs, and monitoring

Fedger.io (Cologne, Germany)

Nov 2018 – Dec 2019

Data Scientist / Machine Learning Engineer

- Using Python (particularly Keras and Tensorflow), one of my primary responsibilities was to build and improve Fedger's object detection deep learning architecture, particularly for clients within the hospitality industry
- By continuously reading research papers and staying up to date with the newest research topics and trends within object detection, another primary responsibility is to propose new ideas to the AI/Data Science team, analyze their possible benefits and drawbacks, and implement these ideas if it may lead to an improvement
- As an example, some of my implementations include Faster R-CNN, Feature Pyramid Networks (FPN), Ensembling of Multiple CNN Models, Learning Rate Scheduling, SGD/Adam/Nadam with Warm Restarts, and multiple loss functions
- Conduct code reviews of other data scientists and software developers to help detect bugs in code and/or logic, optimize code for performance and readability, and ensure consistency regarding its documentation (Flake8, Pycodestyle, MyPy, PEP8, etc.)

Co-op Insurance (Manchester, England)

June 2018 – Sep 2018

Data Science Intern

- Conducted extensive research of both historical and state-of-the-art machine learning algorithms to determine the benefits and drawbacks of using each and determine its plausibility given the company's technological constraints
- Through the use of R, pre-process and clean the company's current dataset consisting of terabytes of customer data
- Implemented non-parametric machine learning algorithms such as Random Forests and XGBoost with different hyper-parameter tuning techniques such as Bayesian Optimization with the Gaussian Process UCB acquisition function
- Account for class imbalances using techniques such as SMOTE and Tomek Links
- Produce a final dissertation that includes previous relevant works, methodologies, findings, results, and conclusions

NASA Ames Research Center (Mountain View, USA)

June 2016 – April 2017

Microgravity Project Intern

- Utilized my mathematical, statistical, and technical skillset in a laboratory setting in order to monitor and analyze the effects that the absence of gravity has on small organisms/bacteria such as Tardigrade and E. coli
- Hands-on experience coding in Python in order to model the path that organisms take when put in our self-built rotating vessel (also known as a clinostat)
- Gathered experimental data through the creation and use of a video camera capable of detecting small organisms

Professional References:

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