

# Hendrik Makait

DATA & SOFTWARE ENGINEER

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## Summary

I am a data and software engineer building systems at the intersection of large-scale data management and machine learning. I have several years of practical experience in designing and building data platforms, data processing pipelines, and applications on top of those. I have trained and mentored new employees for the data teams of multiple startups and enabled them to take ownership of their data infrastructure. This is combined with academic and research experience in large-scale data processing and machine learning from my M.Sc. in Computer Science and award-winning work on message brokers on modern hardware as a student researcher. Thanks to my additional background in entrepreneurship and business management, I do not only solve technical problems but take ownership of the systems I built with the business goals in mind.

## Work Experience

### SiaSearch

Berlin, Germany

DATA ENGINEER

09/2020 - PRESENT

- Redesigned the data storage to use a data lakehouse architecture and implemented the first iteration of a transactional metadata layer for data cataloging and the accompanying data ingestion process.
- Designing and implementing a scalable query engine with event semantics based on Apache Arrow.
- Building backend and data infrastructure for unstructured sensor and vision data.

### Hasso Plattner Institute

Potsdam, Germany

STUDENT ASSISTANT AT THE DATA ENGINEERING SYSTEMS GROUP

05/2019 - 05/2020

- Continued working with Prof. Rabl as first hire and assisted with creating the new group.
- Designed a novel message broker architecture that leverages remote direct memory access and persistent memory as my master thesis. This work was awarded 2nd Place (Graduate) at the *ACM SIGMOD 2020 Student Research Challenge*.
- Designed and executed a benchmark of existing message brokers.
- Researched approaches to causal discovery and how to bring these concepts into real-world systems.

### Technical University Berlin

Berlin, Germany

STUDENT RESEARCH ASSISTANT AT THE DATABASE AND INFORMATION MANAGEMENT GROUP

04/2018 - 04/2019

- Analyzed the robustness of game-theoretic approaches to inferring influence between senators from their voting behavior and showed high instability of learned parameters with respect to hyperparameters and minor manipulation of the data.
- Deeply investigated concepts of causality and how to bring causal discovery mechanisms to data systems.

### Project A Ventures

Berlin, Germany

DATA ENGINEER

06/2015 - 09/2017

- Lead engineer on a three months project analyzing the balance of a 500+MM USD marketplace. Built data pipelining, a dashboard solution as well as marketing automation based on our findings. This has helped to increase the revenue of the company and intelligently allocate marketing budgets.
- Designed, implemented and extended data warehouses, large data processing pipelines and data products built on top of those.
- Analyzed and predicted KPIs by using customer and marketing data.
- Interviewed and educated new data teams for the ventures.

### owlhub. UG

Hamburg, Germany

CO-FOUNDER

01/2014 - 09/2014

- Co-founded a stock analysis network for the everyday investor.
- Main responsibilities were around Product, Data and Marketing. Developed the web application in Ruby on Rails.
- Developed owlhub. Insights dashboard as part of Harvard CS 171 Visualization.

### Otto (GmbH & Co. KG)

Hamburg, Germany

CO-OP STUDENT IN COMPUTER SCIENCE AND BUSINESS MANAGEMENT

10/2011 - 03/2015

- Performed the practical part of the integrated degree program in the form of several internships within Otto Group companies.
- Internships in the areas of project and product management, software development, venture capital and data science.
- Two internships highlighted below:

### otto group

Hamburg, Germany

DATA SCIENCE INTERN IN BUSINESS INTELLIGENCE

11/2014 - 03/2015

- Wrote bachelor thesis on "Evaluation of Methods for Identifying Brand Names in Search Queries in E-Commerce". Researched methods and helpful metrics for the identification task. Extended existing and implementing new metrics, methods and machine learning algorithms and thereby decreased the run-time of the existing approach by 75 %.
- Test-driven and agile development in Python using various third-party libraries.

## Blue Yonder GmbH

Hamburg, Germany

### DATA SCIENCE INTERN

06/2014 - 08/2014

- Data science using Python combined with proprietary and open-source libraries.
- Performed initial data exploration and preparatory model development for a customer project on dynamic pricing in the travel industry. This analysis was the foundation of subsequent negotiations and project scope definitions.
- Supported the creation of a tutorial on data science for external customers.

## YMCA Youth Center Lemsahl

Hamburg, Germany

### MANDATORY CIVILIAN SERVICE

10/2010 - 05/2011

- Led events, youth groups, and a summer camp together with teams of volunteers and regular staff.
- Supervised and supported volunteers.
- Supported day-to-day operations of the center and designed web and print media.

## Education

### Technical University Berlin

Berlin, Germany

#### M. SC. IN COMPUTER SCIENCE (GPA: 1.0 - BEST GRADE)

2017 - 2020

- Specializing in scalable data systems and machine learning.
- Awarded 2nd place at the *ACM SIGMOD 2020 Student Research Challenge* for my work on *Rethinking Message Brokers on RDMA and NVM*.
- Working as a student researcher beginning with the second semester with a focus on causal learning and data processing on modern hardware.
- Scholar of the Klaus Murmann Fellowship Program of the Foundation of German Business.

### Harvard University & Massachusetts Institute of Technology

Cambridge, MA, USA

#### VISITING UNDERGRADUATE STUDENT

2014

- Took courses in machine learning, data visualization as well as economics and computation at Harvard College.
- Took a course on entrepreneurship at the MIT Sloan School of Management.

### NORDAKADEMIE Hochschule der Wirtschaft

Elmshorn, Germany

#### B.SC. IN COMPUTER SCIENCE AND BUSINESS MANAGEMENT (GPA: 1.4)

2011 - 2015

- Academic part of the co-op program in cooperation with Otto (GmbH & Co. KG).
- Served as Head of the Departmental Student Society for Computer Science and Business Management.
- Received scholarship from the Klaus Murmann Fellowship Program of the Foundation of German Business (SDW).

## Master Thesis

### Rethinking Message Brokers on Modern Hardware

Over the last years, message brokers have become an important part of enterprise systems. As microservice architectures become more popular and the need to analyze data produced by the individual services grows, companies increasingly rely on message brokers to orchestrate the flow of events between different applications as well as between data-producing services and stream processing engines that analyze the data in real-time. Current state-of-the-art message brokers such as Apache Kafka or Apache Pulsar were designed for slow networks and disk-based storage. In this work, we propose a new architecture that leverages remote direct memory access (RDMA) and non-volatile memory (NVM) to improve the weaknesses of existing message brokers and further scale these systems.

## Publications

2020

**Rethinking Message Brokers on RDMA and NVM**, Proceedings of 2020 International Conference on Management of Data (SIGMOD '20)

Portland, OR, USA

## Honors

2020

**2nd Place (Graduate) at the ACM SIGMOD 2020 Student Research Challenge**, Association for Computing Machinery

Portland, US

2013 - 2020 **Klaus Murmann Fellowship Program**, Foundation of German Business (SDW)

Berlin, Germany

## Skills

**Programming Languages** Python, SQL, Java, C++, JavaScript, HTML, CSS

**Operating Systems** Linux, Mac OS X, UNIX

**Systems & Tools** PostgreSQL, Google BigQuery, Apache Flink, Apache Kafka, pandas, NumPy, scikit-learn, Flask, GCP

**Languages** German (native), English (fluent), French (basics), Spanish (basics)

References are available upon request.