Joel Beck

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EXPERIENCE

Undergraduate Research Assistant
June 2020 – Present

Texas A&M University
College Station, TX

- Developed a REST API using FastAPI and PostgreSQL to store data from learning management systems
- Developed a full-stack web application using Flask, React, PostgreSQL and Docker to analyze GitHub data
- Explored ways to visualize GitHub collaboration in a classroom setting

Information Technology Support Specialist
Sep. 2018 – Present

Southwestern University
Georgetown, TX

- Communicate with managers to set up campus computers used on campus
- Assess and troubleshoot computer problems brought by students, faculty and staff
- Maintain upkeep of computers, classroom equipment, and 200 printers across campus

Artificial Intelligence Research Assistant
May 2019 – July 2019

Southwestern University
Georgetown, TX

- Explored methods to generate video game dungeons based off of *The Legend of Zelda*
- Developed a game in Java to test the generated dungeons
- Contributed 50K+ lines of code to an established codebase via Git
- Conducted a human subject study to determine which video game dungeon generation technique is enjoyable
- Wrote an 8-page paper and gave multiple presentations on-campus
- Presented virtually to the World Conference on Computational Intelligence

EDUCATION

Georg-August-University of Göttingen
Göttingen, Germany

Master of Science: Applied Statistics
Sep. 2020 – Sep. 2023

- Overall Grade: 1.0 (Top 1%)
- Focus: Machine Learning, Deep Learning (NLP)
- Thesis: *[Bridging Citation Analysis and Language Models: A Hybrid Recommender System for Computer Science Papers](#)*

University of Oslo
Oslo, Norway

ERASMUS Study Abroad
Aug. 2018 – Dec. 2018

- Courses in Risk Analysis & Actuarial Science

University of Mannheim
Mannheim, Germany

Bachelor of Science: Mathematics in Business and Economics
Sep. 2016 – March 2020

- Overall Grade: 1.2 (Top 5%)
- Focus: Statistics, Probability Theory, Econometrics

Ludwigsgymnasium Saarbrücken
Saarbrücken, Germany

Abitur
Sep. 2007 – July 2015

- Overall Grade: 1.0 (Top 1%)

SCHOLARSHIP

Stiftung der deutschen Wirtschaft
Oct. 2016 – Sep. 2023

- Awarded for academic excellence and social engagement

TECHNICAL SKILLS

Languages: Python (3 Years), R (2 Years), Go (6 Months), Typescript (6 Months), SQL (SQLite), Bash
Developer Tools: Git, GitHub, GitHub Actions, GitLab, GitLab CI, Docker, Jira, Confluence, VS Code
Writing: LaTeX, Markdown, RMarkdown, Quarto, Jupyter Notebooks, MkDocs

Projects

readnext | *Python, transformers, sklearn, gensim, spacy, polars, requests, pydantic, pytest, MkDocs* 2023

- Developed a hybrid recommender system for computer science papers, resulting in 67% higher Mean Average Precision (MAP) than the baseline.
- Constructed a dataset from Semantic Scholar API and preprocessed it using spaCy and polars.
- Applied multiple language models including SciBERT, FastText, and TF-IDF for recommendations.
- Ensured robustness with 88% test coverage, user input validation and continuous integration.
- Provided comprehensive documentation with MkDocs, deployed to GitHub Pages.

drafts | *Typescript, Javascript, Bun* 2023

- Developed action scripts for the Drafts app, automating text editing tasks.
- Solved the challenge to develop actions in Typescript using external editors, enhancing productivity.
- Implemented bundling process with Bun to bundle Typescript files into Javascript and ensure compatibility with Drafts.

postforecasts | *R, tidyverse, testthat, RMarkdown* 2022

- Crafted an R package for post-processing of Covid-19 forecasts.
- Contributed custom methods (Conformalized Quantile Regression and Quantile Spread Averaging) for enhanced post-processing.
- Utilized tidyverse packages for data wrangling and visualization, and testthat for unit testing.

airbnb-oslo | *Python, pytorch, sklearn, pandas, seaborn, beautifulsoup, LaTeX* 2022

- Predicted Airbnb prices in Oslo using an ensemble regression model, outperforming Ridge, Random Forest, XGBoost and Fully Connected Neural Network.
- Enhanced data by scraping apartment images using BeautifulSoup.
- Developed a CNN with PyTorch for image-based price categorization.
- Analyzed latent space distribution using Variational Autoencoder (VAE).

shrtcts | *R, RStudio* 2022

- Developed a collection of RStudio shortcuts using the shrtcts package.
- Enabled keyboard-triggered commands to automate developer tasks, increasing productivity.

asp21bridge | *R, tidyverse, testthat, S3, roxygen2, RMarkdown* 2021

- Created an R package featuring a Bayesian MCMC sampler with Ridge penalization.
- Offered extensive diagnostic visuals and summaries using ggplot2.
- Facilitated comparison between frequentist MLE and Bayesian estimates with/without Ridge penalization.
- Introduced a custom S3 class for sampling outputs, incorporated unit testing with testthat, documented with roxygen2.