Louis Deschuttere

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GitHub: https://github.com/louisds/Machine-Learning

EDUCATION

- **Yale University** — New Haven, CT
  MS in Statistics and Data Science; GPA: 4.00 — *Sep 2021 - Dec 2022*
  - **Coursework**: Machine Learning, Unsupervised Learning for Big Data, Deep Learning Theory, Natural Language Processing (NLP), Deep Learning on Graph Data, Probability and Bayesian Statistics, Data Analysis, Statistical Computing
  - **Teaching Assistant**: Introductory Statistics (144 students) and Intermediate Machine Learning (98 students)

- **Ghent University** — Ghent, Belgium
  MS in Civil Engineering - Dredging and Offshore; 846/1000 - First in class of 48 — *Sep 2018 - Sep 2020*
  - **Thesis**: Constructed a CFD model of a ship's propeller jet with C++, investigating the pressure and velocity field on canal bottoms. Pioneered a number of advanced optimization techniques, leading to a more economical canal design.

- **Ghent University** — Ghent, Belgium
  BS in Civil Engineering - Applied Mathematics; 724/1000 — *Sep 2014 - Jun 2018*

ACADEMIC PROJECTS

- **Personalized Recommender System**: Used a graph attentive NN model with BERT embeddings of existing reviews (e.g. Tripadvisor) to create a recommender system able to generate human-like personalized explanations for the recommendations.
- **Music Generation and Genre Classifier**: Developed a CNN framework able to classify 10 genres of music based on their spectrogram and sound amplitude timeline. Used GANs and VAEs to generate music and perform style transfer.
- **CT Housing Price Prediction**: Web scraped Zillow site to obtain numerical, categorical, and textual data, with the ultimate goal of predicting the housing market in Connecticut. Performed topic modeling on Zillow reviews for a boost in accuracy.
- **Other Projects**: Contrastive learning to better represent graphs of molecules (GCN, GIN, t-SNE), deep reinforcement learning on the Flappy Bird game (deep Q), Spotify recommendations based on word embeddings (Word2Vec, GloVe), text generation with non-attention (RNN, GRU, LSTM) and transformer-based models (finetuned GPT-2) trained on my own textual data.

SKILLS

- **Technical Skills**: Python (Numpy, Pandas, Scikit-learn, TensorFlow, PyTorch, SciPy, Keras, Matplotlib, Pickle, NetworkX, NLTK, Gensim, Transformers, Re, Beautifulsoup, PyG), R, Latex, Matlab, AWS, C, C++, SQLite, PostgreSQL, Unix Scripting
- **Machine Learning Skills**: Linear and Logistic regression, Web Scraping, Visualization (t-SNE, PCA, LDA, MDS), Clustering (k-means, spectral), Deep Learning Fundamentals (MLP, autoencoders, VAE, CNN, GAN, RNN), Natural Language Processing (LSTM, Transformers, BERT, Sentiment Analysis), Graph Structures (GNN, GCN, Graph Attention, Recommender Systems)
- **Other**: Dutch (Native), English (Fluent - TOEFL IBT: 110/120), French (Proficient), German (Beginner)

WORK EXPERIENCE

- **Yale Astrophysics Department** — New Haven, CT
  ML Research Assistant — *Sep 2022 - Dec 2022*
  - **Prediction of Merging Galaxies**: Developing a machine learning (ML) tool to detect merging galaxies based on image data (James Webb Telescope, ...) by using a CNN embedding framework and active learning techniques.

- **Fidelity Investments** — Boston, MA
  Advanced Data Science Intern - Received full-time offer — *Jun 2022 - Aug 2022*
  - **FinBERT Sentiment Analysis**: Focused on NLP techniques (LSTM, BERT) to automate the rating of stocks (score from 1 to 6) based on equity analyst notes, leading to a significant reduction in work overload for portfolio managers (PMs).
  - **Investment Recommendations**: Used alternative data (web scraping) to advise PMs on investment decisions.

- **Slaagsleutels** — Leuven, Belgium
  Private Tutor — *Feb 2021 - Jun 2021*
  - **University Level Tutor**: Tutored 6 university students by 1:1 mentoring sessions in mathematics, statistics, and probability, which learned me to explain complex things in a clear and simple manner

- **Humasol** — Burkwoyo, Uganda
  Voluntary Engineer — *Jul 2019 - Aug 2019*
  - **Water and Sanitary Project**: Constructed and supervised a solar pumping installation, still providing up to a 1000 inhabitants with drinkable water. Learned how to work under time pressure and lead a team of 30 people

HONORS AND AWARDS

- Received title of Belgian American Educational Foundation (BAEF) Fellow (7 Belgians a year - $60k fellowship)

- Obtained best Civil Engineering graduate thesis award.

- Ranked first among 48 students in my Civil Engineering Master's and responsible for the valedictory speech.