SVEN DEGROEVE

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With 20+ years of experience in Artificial Intelligence, I bring deep expertise in machine learning (scikit-learn), deep learning (TensorFlow, PyTorch), and generative AI (Hugging Face, LangChain). I have strong MLOps skills and cloud proficiency (Google Vertex AI). For over a decade, I've led ML research advancing innovation in biotechnology and life sciences. As an associate professor at Ghent University, I teach advanced AI topics including Transformers, LLMs, and AI agents. At VIB, I advise interdisciplinary teams on applying AI to real-world challenges. While my track record is rich in health sciences, I'm equally passionate about extending AI into new and diverse sectors. Consider me an AI evangelist, driven to turn cutting-edge methods into practical impact.

PROFESSIONAL CAREER

Associate Professor of Machine Learning for Biomedical Data, Senior Lecturer

Oct 2019 – Present | Faculty of Medicine and Health Sciences, Ghent University

I am rewarded with a 10% Associate Professorship to further advance my educational initiatives. Please find the links to my course below. I serve as (co-)promoter for pre- and postdoctoral researchers. I am a member of the Educational Committee for Biomedical Sciences, the IT Committee, and the Health Intelligence Network Ghent, a multidisciplinary initiative that brings together expertise in AI and healthcare.

Senior Staff Scientist, AI Expert

Mar 2017 – Present | CompOmics, VIB-UGent Center for Medical Biotechnology, Zwijnaarde

I lead a team of machine and deep learning researchers within the Computational Omics and Systems Biology Group (CompOmics). Our machine learning models are currently being integrated into Bruker Corporation's commercial software to enhance the analysis of mass spectrometry data. I lead the development of a SaaS called ionbot™ funded by an Industrial Research Fund grant. I consult research groups at VIB and the Ghent University Hospital about the application of AI in research projects.

Machine Learning Researcher

Jul 2009 – Feb 2017 | CompOmics, Medical Biotechnology Center, VIB, Ghent University

I advanced biotechnology research by modelling the behaviour of small molecules and proteins using advanced machine and deep learning models. I played a pivotal role in securing high-budget grant funding and attracting top talent to the CompOmics team by integrating machine learning and AI into the Master's program in Biomedical Sciences.

Senior Knowledge Systems Engineer
Oct 2008 – Mar 2009 | MDCPartners, Antwerp

I ported machine learning models for clinical trial optimization and medical expert identification to the Java programming language.

Data Analyst, Senior Scientist (biomarker discovery, statistics)
Oct 2005 – Aug 2008 | Pronota, Technologiepark Zwijnaarde (now part of Biocartis, Mechelen)

I was responsible for the experimental design and statistical analysis of proteomics studies for both discovery platform development and biomarker discovery (Python, R, Spotfire). I evaluated and communicated key issues, derived from data analysis, affecting biomarker discovery and data quality.

Post-doctoral Fellow (audio signal AI)
Jan 2005- Sep 2005 | KERMIT, Ghent University

I implemented and trained machine learning algorithms (support vector machines) to improve the annotation of drums and snares in raw audio signals (very early WAV to MIDI conversion).

PhD (genomics AI revolution)
Jan 2001 –Dec 2004 | Ghent University, Flemish Institute for Biotechnology (VIB)

I implemented and improved the support vector machine learning algorithm for the automatic annotation of newly sequenced genomes.

Machine Learning Researcher (HIV virus mutations)
Jan 2001 – Dec 2001 | Tibotec Virco, Mechelen

I investigated the application of machine learning algorithms for the analysis of complex virus mutation patterns of protease resistance in HIV data.

Machine Learning Research Assistant (chatbots, AI dialogue systems)
Sep 1999 – Dec 2000 | Centre for Evolutionary Language Engineering (CELE), L&H, Ieper

I investigated and implemented state-of-the-art machine learning algorithms for solving Natural Language Processing tasks to further improve the AI dialogue systems commercialized by the company Lernout&Hauspie (L&H).

EDUCATION

Doctorate (Ph.D.) in Sciences: Computer Science
Ghent University | 2001 – 2004
Title of thesis: “Design and evaluation of a linear classification strategy for gene structural element recognition”

Licentiate (Master in Sciences) in Information Technology
Ghent University | 1997 - 1999
Title of thesis: “Classification of skin lesions with neural networks”

TECHINCAL SKILLS

Expert

Programming: Python, Pandas, Visual Studio Code, SQL
Machine Learning: Scikit-learn, Auto-sklearn, Scikit-multilearn, Hyperopt, Kaggle
Deep Learning: PyTorch (Lightning), Tensorflow (Keras), MLFlow
Data exploration: Seaborn, Plotly, Tableau Software
Cloud: GitHub, Docker

Intermediate

Programming: C, Cython, R, javascript
Deep Learning: HuggingFace API
Generative AI: LangGraph
Cloud: Google Compute Engine (Vertex AI), Microsoft Azure, Kubernetes
Other: Flask, Streamlit

SOFT SKILLS

I am a skilled communicator with a passion for teaching AI to both master's students at Ghent University and industry partners at VIB. My teaching emphasizes hands-on programming with frameworks such as scikit-learn and PyTorch. Current courses:

Machine Learning methods for Biomedical Data (D012554)

Ghent University | yearly since 2016 | 55 hours
GitHub: https://github.com/sdgroeve/Machine_Learning_course_UGent_D012554_2025

Large scale analysis of Biomedical Data (D013628)

Ghent University | yearly since 2015 | 10 hours

Machine Learning & Deep Learning Workshop

Flemish Institute for Biotechnology (VIB) | twice a year since 2018 | 32 hours
Link: https://training.vib.be/all-trainings/machine-learning-deep-learning-workshop

RECENT PROJECTS

Small molecule, peptide and protein behaviour prediction

Leading advancements in machine and deep learning for computational proteomics, my team develops predictive models that are actively used in top international laboratories. Notable contributions include MS2PIP, DeepLC, and MS2Rescore.
Frameworks: Scikit-learn, Tensorflow and Pytorch

The ionbot™ data-driven open-modification search (OMS) engine

A SaaS implementation of our open-source tools.
Frameworks: Cython, Kubernetes, KEDA

Phosphorylation prediction with Protein Language Models (PLMs)

Exploring the information content of protein embeddings (e.g. ESM2) for the prediction of potential protein post-translational modification sites (link).
Framework: PyTorch Lightning

LANGUAGES

Dutch (native proficiency), **English** (advanced C1 level), **French** (intermediate proficiency)

SCIENTIFIC PUBLICATIONS

Google Scholar: https://scholar.google.nl/citations?user=pzwt3NYAAAAJ&hl=en
UGent Biblio: https://biblio.ugent.be/publication?text=sven+degroeve

CERTIFICATES

Neural Networks and Deep Learning (Coursera), issued Nov 2019
Structuring Machine Learning Projects (Coursera), issued Jan 2020
Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization (Coursera), issued Jan 2020
CEFR level C1 on the Interuniversity Test of Academic English, issued Sep 2019