Bart-Jan Boverhof
Expert AI for Healthcare

Personal website
Linked In
Google Scholar
GitHub

Place of residence: Breda

PROFIEL:

My name is Bart-Jan Boverhof, a structured and **analytical researcher** with a passion for **Artificial Intelligence** (AI), **statistics**, and **health technology**. As a PhD candidate at the Erasmus School of Health Policy & Management, I specialize in the valuation of clinical AI systems, focusing on areas such as cost-effectiveness, epidemiology and statistics. My research focuses on the optimization of **value-driven** implementation of AI in healthcare. In my research I also follow my passion for AI by exploring and leveraging these tools in my workflow. I furthermore conducted research on how **large langue models (LLMs)** could be used to optimize aspects of the **health technology assessment** (HTA) process. I have a (research) master's in applied **statistics**, where I worked on **deep learning**, **Bayesian inference**, **multilevel modelling,** etc.

I have hands-on experience with advanced AI methods, including machine learning, deep learning, Bayesian inference, and health economic modeling. I am proficient in **Python**, **R**, and tools such as **Keras**, **PyTorch**, **TensorFlow**, **LangChain**, **Git**, and **Excel**. I have experience in developing a variety of models, including predictive models, simulation studies, and health economic models.

In addition to my technical expertise, I am recognized for my **precision**, **structured approach**, and **eagerness to learn**. I enjoy fostering **connections**, and **collaboration** with others. My experience presenting at conferences and seminars, combined with four years of **teaching** master-level university courses on statistics and health economic modeling, has developed my skills as a clear and effective **communicator** and **speaker**. For more information on my profile and past projects, please consult my personal website.

Experience:

Mar. '22 – Mar. '26

PhD Candidate | Erasmus University

Advisors:
prof.dr MPMH Rutten-van Mölken[1]; prof. dr. CA Uyl-de Groot[1]; dr. WK Redekop[1]; dr. J.J. Visser[2]
[1] Erasmus School of Health Policy and Management, Erasmus University
[2] Erasmus Medical Centre, Radiology and Nuclear Medicine

Context:
Erasmus School of Health Policy & Management (ESHPM) is part of the Faculty of Medicine and Health Sciences of Erasmus University Rotterdam (EUR). I was embedded in the health technology assessment (HTA) research group, one of the leading groups in HTA research in the Netherlands.

My PhD research was focused on moving beyond the hype, and appropriately valuating AI. I conducted literature reviews, and developed methodologies with which AI value could be scrutinized. These were furthermore used in two case studies where AI was valuated from a health economic perspective. There was continuous close collaboration with the Erasmus medical centre throughout the project. I furthermore explored how large language models could be used to optimize the HTA process.

Role and responsibilities:

- o **Research:** Roughly 75% of my time was devoted to research, including project management, model programming, analysing results, data visualization, reading literature, writing manuscripts, presenting and communication work, etc.
- o **Teaching:** Roughly 15% of my time was dedicated to teaching in the master-level courses advanced health economic modelling, and advanced research methods, as well as the supervision of students in their master-thesis project.
- o **Education:** Roughly 10% of my time was devoted to education, including courses on health economic modelling, artificial intelligence, teaching and supervision, academic writing, etc. (see also coursework.

Skills and Applied Methods:

- o **Project management:** In addition to carrying out the PhD project, an important role I assumed was that of project manager. This includes tasks such as leading meetings, fostering collaborations, communication with project funders, and giving direction.
- o **Public speaking:** A key part of research is communication. I improved my public speaking skills through presenting my research on various conferences and seminars. Teaching has also significantly improved my public speaking skill. I further developed as public speaker by delivering my self-created workshop on empowering research with AI, which I did in various groups.
- o **Communication:** I further developed active and precise communication skills through my role of managing my own project, teaching, and supervision of students in writing their master thesis.
- o **Leadership:** I took the opportunity to develop myself as leader through taking initiative in my own projects and PhD. I furthermore lead a workgroup package on health economic modelling of an international consortium on glaucoma screening. In the local student chapter of the largest society on health economics (ISPOR), I assumed the role of vice-president.
- o **Literature:** In order to develop as an independent researcher, it is essential to gain understanding of the literature. I did so through reading many papers and books on what constitutes value in medical AI, and on the health technology assessment literature, as well as conducted two literature studies. I immersed myself in the literature on pulmonary embolisms and glaucoma for the specific use-cases I conducted.
- o **Academic writing:** A component of my development as researcher was the effective, clear, precise, and yet concise, writing of academic papers.
- o **R programming**: Most of my programming was conducted in R (with Tidyverse). This included modelling, data science, simulation and visualisation.
- o **Python programming**: I conducted programming of AI models, and everything directly leveraging AI in Python.
- o **Git(Hub):** I maintained version control and collaboration with Git, which entails a better code maintenance and collaboration with others.

Tech Stacks: R, Python, Tidyverse, PyTorch, Git(Hub), LangChain, Excel, SPSS, STATA, Cost-effectiveness Analysis, Microsimulation, Markov-Chain Monte-Carlo sampling, RWE analysis, ASReview, Large language models, Deep-learning, Prompt Engineering, GPT-4, ChatGPT

OTHER EXPERIENCE:

May. '21 - Sep. '21

Research Intern | ASReview at Utrecht University

Context:
ASReview is an open-source software project for AI-aided systematic reviews at Utrecht University. The software uses active learning to speed up the screening phase of abstracts and titles in a systematic review of academic papers.

My developed a convolutional neural network architecture for systematic reviews with ASReview and conducted a simulation study to compare its performance with other algorithms. The algorithm and report of the study are published open-source on my GitHub page.

Skills and Applied Methods:

- o **Python programming:** The algorithm was programmed in Python with the TensorFlow and Keras libraries for machine learning and deep learning.
- o **Open-source software collaboration:** My internship was embedded in a big open-source software project, meaning I learned how to collaborate with a large group of people online. I experienced how collaboration can be fostered with many people over the world, and what an open-source software project entail. This was empowered by Git.
- o **Machine learning:** I explored various deep learning architectures such as convolutional neural networks, as well as more classical machine-learning architectures.

Tech Stacks: Python, TensorFlow, Git(Hub), ASReview, Deep-learning, Convolutional Neural Networks (CNN), Hyper-parameter optimization, Simulation study, Classical Machine-Learning, LaTeX markup language

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Sep. '20 - Jun. '21

Research-Master Thesis 'Physiological Sensor-Based Prediction of Mental Workload: A Multimodal Deep Learning Approach' | Utrecht University & Thales Group Netherlands

Context:
As part of my master Methodology and Statistics for the Behavioral, Biomedical and Social Sciences at Utrecht University, I conducted a master-thesis project wherein I developed a multimodal deep-learning architecture for the classification of mental workload. I used three modalities of physiological data which are indications of the degree of mental workload: Electroencephalography (EEG), photoplethysmogram (PPG) and galvanic skin response (GSR). The model architecture and thesis can be found on my GitHub page.

Skills & applied methods:

- o **Model development.** I developed the multimodal neural network to predict mental workload in Python, with the deep-learning library PyTorch. Each of the three physiological modalities were modelled with convolutional neural networks (CNN) that fed into one main network that handled prediction. I implemented hyper-parameter optimization to optimize the model architecture.
- o **Data preparation.** Together with Thales, I developed a script to clean and set-up the physiological data and get it in a usable format to be processed by the neural network.
- o **Academic writing:** I presented the results the results of this project in the form of a concise research paper that can also be found in the GitHub repository.

Tech Stacks: Python, PyTorch, Pandas, Git(Hub), Deep-learning, Convolutional Neural Networks (CNN), Multimodal Network, Data science, Hyper-parameter optimization, LaTeX markup language

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Jul. '18 - Feb. '21

Research Assistant Various Projects | Utrecht University & National Institute for Public Health and the Environment

Throughout my bachelor studies, I contributed to various projects as research assistant. I contributed to data collection within the European Union Physical Activity and Sport Monitoring System (EUPASMOS) project. This involved the instruction of participants in how to use the physical monitoring equipment, and interviewing participants regarding their health and physical activity.

I also contributed to the organisation of the second edition of the "BigSurv Big Data Meets Survey Science Conference" and the ninth edition of the "European Survey Research Association Conference". This involved amongst others procedural tasks, scheduling and session-chairing.

Education:

2019 -2022	**M.Sc. Methodology and Statistics for the Behavioral, Biomedical and Social Sciences**	Utrecht University
	Coursework: Human Centred Machine-Learning, Biomedical Statistics, Mathematical Statistics, Computational Inference with R, Markup Languages & Reproducible Programming, Research Seminar, Bayesian Statics, Multilevel and Structural Equation Modelling	
2016 - 2019	**B.Sc. Sociology**	Utrecht University
	Coursework: e.g., Programming with Python, Missing Data Theory and Causal Effects, Measurement and Modelling with Social Data, Theory Construction and Statistical Modelling, Social Networks in Theory & Empirical Research, Conducting a Survey	
2014 – 2016	**Economics & Marketing**	Noordelijke Hogeschool Leeuwarden
2009 - 2014	**HAVO**	Regionale Scholen Gemeenschap Tromp Meesters

TRAINING & EDUCATION POST-MASTER

2025	LLM Engineering: Master AI & Large Language Models (LLMs) (Udemy)
2025	LangChain – Develop LLM powered Applications with LangChain (Udemy)
2025	Using R for Decision Modeling in Health Technology Assessment (NIHES)
2024	AI-Powered HEOR (ISPOR Europe Short course)
2023	University Delivery Qualification (Erasmus University)
2023	Microlab: How to Supervise Students (Erasmus Unversity)
2022	Applied Cost-Effectiveness Modelling with R (ISPOR Europe Short course)
2022	Alternative Economic Assessment for Expressing Healthcare Value and Informing Resource Allocation Decisions (ISPOR Europe Short course)
2022	English Academic Writing
2022	Advanced Health Economic Modelling (Erasmus University)
2022	Professionalism and Integrity in Research

TECH STACKS & SKILLS:

- R
- Tidyverse
- Shiny
- Python
- Pandas
- PyTorch
- TensorFlow
- Keras
- Git(Hub)
- Mplus
- SPSS
- STATA
- Excel
- ASReview
- LaTeX
- GPT-4
- Cost-Effectiveness Analysis
- Health Technology Assessment
- Microsimulation
- Data Science
- MCMC-sampling
- Deep-Learning
- Neural Networks
- Machine-Learning
- Deep-Learning
- Retrieval- Augmented Generation (RAG)
- Computer Vision
- Text Mining
- Natural Language Processing (NLP)
- Large Langue Models
- Multi-level modelling
- Structural Equation Modelling
- Bayesian Statistics
- Predictive Modelling