

# Maarten van der Velde

Applied cognitive scientist & data scientist

🏠 maartenvandervelde.com    ✉️ maarten.a.vandervelde@gmail.com

## EXPERIENCE

### Senior researcher | MEMORYLAB

2023 – Present | Groningen, The Netherlands

- Responsible for scientific development of adaptive learning software (1.6M licenses per year).
- Combining insights from theory, computational modelling, educational practice and data analysis to improve learning and knowledge assessment.

### PhD candidate | UNIVERSITY OF GRONINGEN

2018 – 2023 | Groningen, The Netherlands

- PhD thesis: "Mastering memory: Theoretical and practical building blocks for better adaptive fact learning" (Cum Laude).

### Lecturer / teacher / teaching assistant | UNIVERSITY OF GRONINGEN

2015 – 2023 | Groningen, The Netherlands

- Involved in teaching 8 courses at undergraduate and graduate level.
- Gave lectures and assisted students at the Cognitive Modeling Spring School.
- Was voted AI Teaching Assistant of the Year (2017).

## SELECTED PROJECTS

### Adaptive fact learning

- Showed that predicting learners' performance on new materials made adaptive learning more efficient and improved retention by over half a grade point. 📄📄\*
- Demonstrated that an adaptive learning system used during a university course could predict exam performance several weeks in advance. 📄

### Cognitive models of memory

- Developed an improved memory model that captures forgetting on timescales from minutes to weeks. 📄
- Demonstrated how individual memory parameters can be inferred from retrieval task data using a novel mapping between ACT-R and the LBA. 📄

### Learning analytics

- Project manager on a €300K grant funded by National Education Lab AI to use predictive learning analytics as a replacement for traditional knowledge tests. 📄
- Analysed a large naturalistic data set (133 thousand students; 115 million trials) to explore how COVID-19 lockdowns affected vocabulary learning. 📄

### Computational psychiatry

- Created and evaluated novel cognitive models of the effects of depressive rumination on working memory and attention. 📄📄

\* 📄 links to relevant publications

## ADDITIONAL ACTIVITIES

### Science outreach

- Co-organised the first Groningen edition of the Dutch Brain Olympiad, a national neuroscience competition for secondary school students.
- Gave demonstrations to audiences of all ages at Weekend van de Wetenschap (Weekend of Science).

## SKILLS

### Cognitive science

Cognitive modelling

Applied cognitive modelling  
Individual difference modelling  
ACT-R & PRIMs  
Accumulator modelling  
Bayesian modelling  
Models of learning and memory

Measurement

Experiment design  
Large-sample data collection  
Adaptive learning tasks

### Data science & AI

Languages:

R • Python

Methods & tools:

Processing (tidyverse, data.table)  
Visualisation (ggplot2, matplotlib)  
Statistical modelling (lme4, glmnet, mgcv, brms)  
Communication (LaTeX, RMarkdown, shiny, Jupyter, HTML/JS)  
Infrastructure (SQL, git, docker, nginx)

## EDUCATION

### PhD in Psychology

UNIVERSITY OF GRONINGEN

2018 – 2023 | Cum Laude

### MSc in Computational Cognitive Science

UNIVERSITY OF GRONINGEN

(formerly Human-Machine Communication)

2015 – 2018 | Cum Laude

### BSc in Artificial Intelligence

UNIVERSITY OF GRONINGEN

2012 – 2015 | Cum Laude