

Daphne Collaris-Miedema

ASSISTANT PROFESSOR IN HUMAN-DATA INTERACTION

Eindhoven, the Netherlands

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Work Experience

Assistant Professor

UNIVERSITY OF AMSTERDAM

- Set up new collaborations

June 2024 - current

Amsterdam, Netherlands

Visiting Researcher

UNIVERSITY OF GLASGOW

- Set up new collaborations
- Worked on a code comprehension project

Feb. 2024 - Apr. 2024

Glasgow, Scotland

PhD on the topic of Database Education

EINDHOVEN UNIVERSITY OF TECHNOLOGY

- Passed with honors (distinction awarded to top 5% of dissertations)
- Research areas: SQL misconceptions, SQL complexity, Teaching interventions
- Obtained the Dutch University Teaching Qualification (BKO)

Dec. 2019 - Jan. 2024

Eindhoven, Netherlands

Education

MSc. in Computer Science and Engineering & MSc. in Human-Technology Interaction

EINDHOVEN UNIVERSITY OF TECHNOLOGY

- MSc Thesis: Towards successful interaction between Humans and Databases

Feb. 2015 - Nov. 2019

Eindhoven, Netherlands

BSc. in Computer Science and Engineering

EINDHOVEN UNIVERSITY OF TECHNOLOGY

- Minor in Human-Technology Interaction
- Software Engineering Project: Application Development for Search Engine Optimization

Sep. 2011 - Feb. 2015

Eindhoven, Netherlands

Teaching Experience

Daily supervision

MSc STUDENTS IN DATA SCIENCE AND AI, COMPUTER SCIENCE AND ENGINEERING

- Dmitrii Orlov: Analysis of Knowledge Engineering pipelines - **Paper in preparation**
- Jeroen Besems: SQL question difficulty on Stack Overflow
- Leonardo Mathon: Code smells in SQL exercises - **Short paper published at ICER 2022**
- Alex Odynchuk: *SQLVis+*, visual representations for queries with variables out of scope - **Paper under review**
- Bas Witters: *SQLVis+*, visual representations for queries with aggregation errors
- Dmitrii Orlov [internship]: Static typing for SQL - **Paper published at PLATEAU 2024**
- Willem Aerts: SQL exercise generation through LLMs - **Paper accepted at DataEd**

2021 - current

Eindhoven University of Technology

Course development and lecturer

KNOWLEDGE ENGINEERING

- Target audience: Elective for MSc students in Data Science and AI (80 students)
- Co-developed a new course for our new Master of Science program
- Delivered part of the lectures
- Managing and grading group work

2021 - current

Eindhoven University of Technology

Instructor

DATA MODELING AND DATABASES

- Target audience: mandatory course for second-year Bachelor students from Computer Science, but the course can also be taken as an elective by other students or as a homologation course
- Leading instruction groups on all kinds of introductory topics (80 students)
- Developing homework exercises and exam questions, and grading them

2020 - current

*Eindhoven University of
Technology*

Senior Supervisor

DATA ANALYTICS FOR ENGINEERS

- Target audience: mandatory course for first-year Bachelor students from all study programs offered at TU/e
- Teaching students the fundamentals of Data Analysis in Python through Jupyter notebooks (250 students)
- Managing student assistants who run the lab sessions for this course (10 assistants)
- Regular instructor since 2017, Senior Supervisor since 2020

2017 - current

*Eindhoven University of
Technology*

Lecturer

PRE-UNIVERSITY COLLEGE

- Developing materials on data cleaning, interpolation and prediction for a high-school audience
- Running lecture/instruction sessions for groups of 20 students

2015

*Eindhoven University of
Technology*

Committees

Logistics and Office of Creative Solutions

EUROPEAN GIRLS OLYMPIAD IN INFORMATICS

- Organising transport of delegations
- Point of contact in case of questions or problems

2024

Veldhoven, Netherlands

Workshop Co-founder and Co-chair

DATAED @ SIGMOD

- Proposing and ideating a workshop to bring together the Data Systems and Computer Science Education communities
- Championing Data Systems Education as a theme of interest for the SIGMOD community
- Co-organising the DataEd workshop at SIGMOD 2022
- Managing all digital presence for the workshop
- Organizing workshop proceedings with ACM TAPS
- Writing a reflection document in preparation for the next iteration of DataEd

2022 - current

SIGMOD

Officer of Talks

AUTONOMIT - SNIC

- Co-organised the yearly Computer Science Symposium for the Dutch Student Symposium on Computer Science and Engineering [Stichting Nationaal Informatica Congres (SNIC)], on the topic of Autonomous Technologies
- Selected appropriate topics for talks on the symposium
- Approached and met with presenters to discuss their talks

2015

Evoluon, Eindhoven

Reviewer

CONFERENCES AND JOURNALS

- SIGCSE '22, '23, and '24 posters
- Computer Science Education journal
- ACM Transactions on Computing Education journal
- Meta-reviews for DataEd'22

University Service

Research group website

DAI.WIN.TUE.NL

- Implementing new features in both the front- and backend
- Brainstorming and designing new pages
- Content management

2021 - current

*Eindhoven University of
Technology*

Internal assessment

RESEARCH QUALITY

- Summarizing internal efforts on research to an external committee
- Discussing strong points as well as suggesting points for improvement

2022

*Eindhoven University of
Technology*

Invited talks

On SQL Complexity for Novices

DUTCH COMPUTER SCIENCE TEACHER DAY ON DIDACTICS [VAKDIDAKTIEKDAG INFORMATICA]

- Explaining why SQL is so interesting to study
- Presenting results from various studies

Sept 2022

Open University, Utrecht

Honors & Awards

INTERNATIONAL

2023	Invited participant , Future Female Faculty program (F+Cube)	<i>TU Delft</i>
2023	Invited participant , Simon Initiative LearnLab Summer School	<i>Carnegie Mellon University</i>
2023	Best paper candidate , Conference on Innovation and Technology in Computer Science Education (ITICSE)	<i>Turku, Finland</i>
2021	Best poster award (audience choice) , Alice and Eve	<i>Nijmegen, NL</i>
2021	Honorable mention and reprint in ACM Inroads , ACM Conference on International Computing Education Research (ICER)	<i>Virtual event</i>
2020	Best poster award , Alice and Eve	<i>Enschede, NL</i>

Academic Contributions

“There is no ambiguity on what to return”: Investigating the Prevalence of SQL Misconceptions

DAPHNE MIEDEMA, MICHAEL LIUT, GEORGE FLETCHER AND EFTHIMIA AIVALOGLOU

- Using our previously developed SQL misconception instrument, we analyzed the prevalence of various misconceptions
- All tested misconceptions were present in the new, larger, student population

2023

*23rd International Conference
on Computing Education
Research*

MSMI1: Towards a Validated SQL Misconceptions Instrument

DAPHNE MIEDEMA, MICHAEL LIUT, GEORGE FLETCHER AND EFTHIMIA AIVALOGLOU

- Using our knowledge on SQL misconceptions, developed an instrument to assess our students
- Validated the instrument through large-scale deployment

2023

*19th ACM Conference on
International Computing
Education Research*

Engaging Databases for Data Systems Education

TONI TAIPALUS, DAPHNE MIEDEMA AND EFTHIMIA AIVALOGLOU

- **Best paper candidate**
- Quantitatively analyzed students' perceptions on what makes an engaging database exercise
- Present an example database that corresponds to metrics as indicated by the students

2023

*Conference on Innovation and
Technology in Computer Science
Education*

Students' Perceptions on Engaging Database Domains and Structures

DAPHNE MIEDEMA, TONI TAIPALUS AND EFTHIMIA AIVALOGLOU

- Qualitatively analyzed students' perceptions on what makes an engaging database exercise
- Identified changes that teachers could make to their databases to increase student engagement

2023

*54th ACM Technical Symposium
on Computer Science Education*

Report on the First International Workshop on Data Systems Education (DataEd'22)

EFTHIMIA AIVALOGLOU, GEORGE FLETCHER, MICHAEL LIUT AND DAPHNE MIEDEMA

- Reflected on the first iteration of our SIGMOD workshop
- Analyzed discussion themes that came up during the workshop

2023

ACM SIGMOD Record

Characterizing Data Scientists' Mental Models of Local Feature Importance

DENNIS COLLARIS, HILDE WEERTS, DAPHNE MIEDEMA, JACK VAN WIJK AND MYKOLA PECHENIZKIY

2022

NordiCHI

- Created an online questionnaire to examine data scientists' assumptions about feature importance techniques
- Identified mismatches between data scientists' expectations and implementations of explanation techniques
- Article in our campus paper on the research: <https://www.cursor.tue.nl/en/news/2022/november/week-2/data-scientists-dont-always-ask-questions-persistently-enough/>

Increasing Awareness of SQL Anti-Patterns for Novices: A Study Design

LEONARDO MATHON AND DAPHNE MIEDEMA

2022

18th ACM Conference on International Computing Education Research

- Developed a tool for identification of SQL anti-patterns
- Teach students to reduce anti-patterns in their queries

So many brackets! An analysis of how SQL learners (mis)manage complexity during query formulation

DAPHNE MIEDEMA, GEORGE FLETCHER AND EFTHIMIA AIVALOGLOU

2022

30th IEEE/ACM International Conference on Program Comprehension

- Calculated various complexity metrics over students' query formulation problem answers.
- Identified a new reason for students' struggle with query formulation: self-imposed complexity.

Expert Perspectives on Student Errors in SQL

DAPHNE MIEDEMA, GEORGE FLETCHER AND EFTHIMIA AIVALOGLOU

2022

ACM Transactions on Computing Education

- Applied a Delphi-like study approach
- Presented SQL experts with student errors and invited their hypotheses on underlying causes

Exploring the Prevalence of SQL Misconceptions: a Study Design

DAPHNE MIEDEMA, EFTHIMIA AIVALOGLOU AND GEORGE FLETCHER

2021

21st International Conference on Computing Education Research

- Preparatory work for the 2023 paper at this same conference.

Let's Ask the Experts: Insights into Student Misconceptions about SQL

DAPHNE MIEDEMA

2021

Alice and Eve '21

- **Best poster award (audience choice)**
- Preliminary work for the ACM Transactions paper

SQLVis: Visual Query Representations for Supporting SQL Learners

DAPHNE MIEDEMA AND GEORGE FLETCHER

2021

Symposium on Visual Languages and Human-Centric Computing

- Developed a research prototype for graph-based visualisation of SQL queries.
- Java and d3.js
- <https://github.com/Giraphne/sqlvis>
- Code package is available to our students in one of our introductory Database courses

Identifying SQL Misconceptions of Novices: Findings from a Think-Aloud Study

DAPHNE MIEDEMA, EFTHIMIA AIVALOGLOU AND GEORGE FLETCHER

2021

17th ACM Conference on International Computing Education Research

- **Honorable mention**
- **Reprinted in ACM Inroads in the category "Worth reading from ICER'21"**
- Ran semi-structured interviews to gather data
- First paper to identify SQL misconceptions based on student data

What are common mistakes that novices make when learning query languages?

DAPHNE MIEDEMA

2020

Alice and Eve '20

- **Best poster award**
- Preliminary work for the ICPC'22 paper