Rianne M. Schouten – Resume

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Research

Jan 2025 - Present

Postdoctoral researcher
Data Mining Group, Eindhoven University of Technology, the Netherlands

My research revolves around developing Local Pattern Mining methods (LPMs) that extract societal relevant, interpretable patterns from data. In particular, I further develop and utilize LPMs to study subgroup discovery in the context of Human-Computer Interaction (HCI), Behavioral Machine Learning (BML) and eXplainable AI (XAI).

Feb 2020 - Dec 2024

Doctoral Candidate
Data Mining Group, Eindhoven University of Technology, the Netherlands

I defended my dissertation on the topic of *Exceptional Model Mining for Hierarchical Data* on 16 January 2025. My dissertation presents multiple new pattern mining methodologies, and additionally demonstrates how to apply these methods in real-world use cases.
Supervisors: prof. dr. Mykola Pechenizkiy, dr. Wouter Duivesteijn.

Funding
In December 2024, I obtained a personal grant (€40k) to investigate the feasibility of integrating LPMs into digital assessment tools.

In 2022, on the topic of Better Imputation by Generative Adversarial NeTworks (BIGANT), I brought together TU/e with Utrecht University and other Dutch universities and contributed to obtaining a seed money grant (€45k).

Awards
My skills and achievements were recognized with a performance bonus in 2021, with two awards for excellent teaching evaluations in 2021 and 2022, and by being pronounced as an excellent reviewer at ECML PKDD 2024.

Supervision
In November 2023, I informally started supervising PhD Candidate Emmanuel C. Chukwu on the topic of Counterfactual Explanations for Multivariate Time Series Classification.

Throughout my PhD program, I supervised about 6 groups of about 5 students per year. Some of these projects have resulted in publications at conferences such as IDA, DS and BNAIC. In addition, I successfully supervised about 10 Master students during their thesis or internship. They all completed their projects, many with high grades.

Project management
I set up multiple fruitful collaborations with researchers from various knowledge institutes, such as Trimbos Institute (the Netherlands), Erasmus MC (the Netherlands) and Turku Research Institute for Learning Analytics (Finland). I furthermore did the project management for our NWO Commit2Data project.

Competencies
Ability to learn – Independence – Analytical skills – Perseverance – Assertiveness – Problem solving – Results-oriented – Project management – Interdisciplinary way of working

June 2017 -   **Researcher**
May 2019   *Department of Methodology and Statistics, University of Utrecht, the Netherlands*

My research focused on evaluating missing data methods, including designing experiments and developing methods for generation of missing values (i.e., amputation).
Supervisors: prof. dr. Stef van Buuren, dr. Gerko Vink.

Statistical consultant

I am trained to be a statistical consultant and support domain experts in doing statistically sound and trustworthy analyses. Some of my projects resulted in domain-specific publications.

Software

I contributed to open source software development. We implemented our multivariate amputation framework in R-function `ampute` in R-package `mice`. Worldwide, people use our method. I still regularly advise and assist researchers with their missing data and amputation problems.

Nov 2016 -   **Staff Associate of Professor Andrew Gelman**
Dec 2016   *Columbia University in the City of New York*

I visited the STAN development team. The visit resulted in a publication.

Sep 2015 -   **SRON, Dutch Institute of Space Research**
Dec 2015   *Internship during MSc., Grade: 9.0*

At SRON, I applied Principal Component Analysis in a Physics context and designed an extensive simulation study. The work resulted in a SPIE conference paper.

Publications

2024   **Schouten, R.M.** On the role of prognostic factors and effect modifiers in structural causal models. Accepted for presentation at Causal Representation Learning Workshop NeurIPS.

2024   van den Berg, N. T., Broekgaarden, B. O., Mahieu Dionysia, P., Martens, J. G., Niederle, J., **Schouten, R.M.** & Duivesteijn, W. Generating MNAR missingness in image data, with additional evaluation ofMisGAN. Accepted for presentation at BNAIC/BeNeLearn 2024.

2024   **Schouten, R.M.**, Stevens, G.W.J.M., van Dorsselaer, S.A.F.M., Duinhof, E.L., Monshouwer, K., Pechenizkiy, M. & Duivesteijn, W. Analyzing the interplay between societal trends and socio-demographic variables with local pattern mining: Discovering exceptional trends in adolescent alcohol use in the Netherlands. Accepted for publication in post-proceedings at BNAIC/BeNeLearn 2024.

2024   **Schouten, R.M.**, Duivesteijn, W., Rasanen, P, Paul, J.M., & Pechenizkiy, M. Exceptional Subitizing Range: Exploring Mathematical Abilities of Finnish Primary School Children with Piecewise Linear Regression. In: Proc. ECML PKDD, pp. 66-82.

2023   **Schouten, R.M.**, Tascau, V., Ziegler, G.G., Casano, D., Ardizonne, M., & Erotokritou M.A. Dropping incomplete records is (not so) straightforward. In: Proc IDA, pp. 379-391.

2022   Verhaegh, R.F.A., Kiezebrink, J.J.E., Nusteling, F., Rio, A.W.A, Bendicsek, M.B., Duivesteijn, W. & **Schouten, R.M.** A Clustering-inspired Quality Measure for Exceptional Preferences Mining — Design Choices and Consequences. In: Proc. DS, pp. 429–444.

2022   Van der Haar, J.F., Nagelkerken, S.C., Smit, I.G., van Straaten, K., Tack, J.A., **Schouten, R.M.** & Duivesteijn, W. Efficient Subgroup Discovery Through Auto-Encoding. In: Proc. IDA, pp. 327-340.

2022   **Schouten, R.M.**, Duivesteijn, W. & Pechenizkiy, M. Exceptional Model Mining for Repeated Cross-Sectional Data (EMM-RCS). In: Proc. SDM, pp. 585-593.

2022 **Schouten, R.M.**, Bueno, M.L.P., Duivesteijn, W. & Pechenizkiy, M. Mining Sequences with Exceptional Transition Behaviour of Varying Order using Quality Measures based on Information-Theoretic Scoring Functions. Data Mining and Knowledge Discovery, 36: 379-413.

2021 **Schouten, R.M.** & Vink, G. The dance of the mechanisms: How observed information influences the validity of missingness assumptions. Sociological Methods & Research, 50(3): 1243-1258.

2020 IJsselhof R, Duchateau S, **Schouten R.M.**, Slieker M, Hazekamp M & Schoof P. Long-Term Follow-Up of Pericardium for the Ventricular Component in Atrioventricular Septal Defect Repair. World Journal for Pediatric and Congenital Heart Surgery, 11(6): 742-747.

2019 IJsselhof R.J., Duchateau S.D.R., **Schouten R.M.**, Freund, M.W., Heuser, J., Fejzic, Z., Haas, F., Schoof, P.H. & Slieker, M.G. Follow-up After Biventricular Repair of the Hypoplastic Left Heart Complex. European Journal of Cardiothoracic Surgery, 57(4): 644-651.

2018 **Schouten R.M.**, Lugtig, P. & Vink, G. Generating missing values for simulation purposes: A multivariate amputation procedure. Journal of Statistical Computation and Simulation, 88(15): 1909-1930.

2017 Kappen, I.F.P.M., Bittermann, G.K.P., **Schouten, R.M.**, Bittermann, D., Etty, E., Koole, R., Kon, M., Van der Molen, M. & Breugem, C.C. Long-term mid-facial growth of patients with a unilateral complete cleft of lip, alveolus and palate treated by two-stage palatoplasty: cephalometric analysis. Clinical Oral Investigations, 21: 1801-1810.

2016 de Vries, C.P., **Schouten, R.M.**, Van der Kuur, J., Gottardi, L., & Akamatsu, H. (2016) [Microcalorimeter pulse analysis by means of principle component decomposition. In: Proc. SPIE 9905, Space TElescopes and Instrumentation 2016: Ultraviolet to Gamma Ray, 99055v. DOI: 10.1117/12.2231627

Teaching

Feb 2020 - Present **Since 2025 as a postdoctoral researcher. Earlier, as a doctoral candidate.**
Data Mining Group, Eindhoven University of Technology, the Netherlands

I lectured 4 Master's courses: Foundations of Data Mining (2020), Research Topics in Data Mining (2021, 2022, 2024).In 2021 and 2022, I received an award for excellent teaching evaluations.

"I took a lot of courses last year, but I like your instructions the most. It is not only because of your professional knowledge, but also because of your personality of being kind, patient, responsible." (Jin Ouyang, Master student)

In my teaching and supervision, I aim to support students in becoming independent learners. I prefer the topics of my teaching to be intertwined with state-of-the-art research.

July 2015, July 2016 **Teaching Assistant**
Summer School Utrecht, the Netherlands

I taught in two summer school courses at Utrecht University, the Netherlands. Both courses are at an advanced Master level:
1) Survey Research: Design, Implementation and Data Processing,
2) Survey Research: Statistical Analysis and Estimation.

"Rianne was a first class assistant at our summer school courses. Not only was all material prepared extremely punctual and without errors, she also got very high student evaluations. I can wholeheartedly recommend Rianne!" (prof. dr. Edith de Leeuw)

Industry experience

March 2018 - **Developer Data & Analytics**
Jan 2020 *Samen Veilig Midden-Nederland, the Netherlands*

I structured and standardized the analyses of sensitive and highly classified data. In addition, I oversaw the system requirements and allocated work to other developers and stakeholders. Software: SQL, R, Logi Analytics, Power BI.

April 2017 - **Data Scientist**
Feb 2018 *DPA Professionals - Excellence Programme for Data Science*

Education

Feb 2020 - **Ph.D. in Data Mining**
Jan 2025 *Eindhoven University of Technology, the Netherlands*

Title: Exceptional Model Mining for Hierarchical Data.

2015 - 2017 **M.Sc. in Methodology and Statistics for the Behavioral, Biomedical and Social Sciences**
Utrecht University, the Netherlands

GPA: 4.0

Sept 2013 - **Preparatory Program Social Policy**
June 2014 *Utrecht University, the Netherlands*

30 ECTS

Feb 2013 - **Preparatory Program Social Sciences**
June 2013 *University of Amsterdam, the Netherlands*

30 ECTS

2009 - 2012 **B.Sc. in Medicine**
Utrecht University, the Netherlands

GPA: 3.24

References

Prof. dr. Mykola Pechenizkiy
Promotor during Ph.D. trajectory
Eindhoven University of Technology, the Netherlands
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Dr. Wouter Duivesteijn
Daily supervisor during Ph.D. trajectory
Eindhoven University of Technology, the Netherlands
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Dr. Gerko Vink
Daily supervisor between 2016 - 2019
Utrecht University, the Netherlands
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Prof. dr. Pekka Räsänen
Collaborator from Turku Research Institute for Learning Analytics
University of Turku, Finland
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