Laura Schütz

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32b, 81369 München

My research in the area of Human-Computer Interaction focuses on understanding how **multimodal interactions** can enhance the usability of **extended reality** user interfaces for **medical applications**. Measuring and modeling human perception for **cognitive load adapted interfaces** is part of the pursuit to provide medical experts with the right information at the right time using the most suitable (combination of) sensory feedback to enhance their **user experience**.

Education

02/2022 - 10/2026

Ph.D. Student in Computer Science

Technical University of Munich
School of Computation, Information and Technology
Chair of Computer Aided Medical Procedures and Augmented Reality
Supervisor: Prof. Nassir Navab, Ph.D.
Mentor: Christoph Leuze, Ph.D., Head of Wu Tsai Visualization Lab, Stanford
Thesis: “Multimodal Intelligent User Interfaces in Medical Mixed Reality“

09/2021 - 06/2023

Master of Science in Engineering, Design Impact

Stanford University, Stanford School of Engineering
Supervisor: Prof. Sean Follmer, Ph.D.
Thesis: ”Shape Sonification for Breast Cancer Localization” (grade: A+)
(GPA 4.0, German grade: 1.0)

10/2017 - 04/2020

Master of Science, Industrial Design

Technical University of Munich, Department of Architecture
Supervisor: Prof. Fritz Frenkler
Thesis: ”A User-centered Approach to Spinal Navigation” (grade: 1.0)
passed with high distinction (grade: 1.2, top 5%)

09/2015 - 09/2016

Study Abroad

ETH Zürich, Department of Architecture

10/2013 - 09/2017

Bachelor of Arts, Architecture

Technical University of Munich, Department of Architecture
Supervisor: Prof. Dr. Dietrich Erben
Thesis: ”Monobloc - An Analysis of a Design Mass Product” (grade: 1.3)
passed with merit (grade: 1.6, top 10%)

09/2005 – 06/2013

Abitur (A-levels)

Thomas-Mann-Gymnasium München, Germany (grade: 1.2 - very good)

Employment

09/2023 - present

Doctoral Researcher, Technical University of Munich (TUM)

Chair of Computer Aided Medical Procedures and Augmented Reality
TUM School of Computation, Information and Technology, Munich, Germany
research on multimodal user interfaces, teaching, and student supervision

01/2022 - 06/2023

Researcher, Stanford University
IMMERS lab (Incubator for Medical Mixed and Extended Reality at Stanford)
Visualization Lab, Wu Tsai Neurosciences Institute
Stanford School of Medicine, Stanford, CA, USA
independent research on audiovisual interactions in medical augmented reality

01/2022 - 03/2023

Teaching Assistant, Stanford University
Hasso Plattner Institute of Design at Stanford University (d.school)
Stanford, CA, USA
lectures on human-centered design and human-computer interaction

10/2020 – 08/2021

Research Assistant, Technical University of Munich
Chair of Computer Aided Medical Procedures and Augmented Reality

12/2018 - 08/2021

Co-Founder, UI / UX Designer – Stella Medical
Interaction design and business development at a medical device startup

04/2019 - 12/2019

Product Design Intern – BMW Group
Creation of micromobility concepts; visualization, prototyping and testing

10/2018 - 03/2019

Design Research Intern – Hyve - the innovation company
User research and testing for NIVEA and Guhl at an innovation consultancy

Publications

Conference papers

2025

Designing Multimodal Interactions in Medical Augmented Reality. **L. Schütz.** Extended Abstracts of the 2025 CHI Conference on Human Factors in Computing Systems (CHI EA '25), April 26 – May 01, 2025, Yokohama, Japan. (accepted / to be presented at CHI'25)

2024

Interactive Shape Sonification for Tumor Localization in Breast Cancer Surgery. **L. Schütz**, T. El Chemaly, E. Weber, A. Doan, J. Tsai, C. Leuze, B. Daniel, N. Navab, Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems, DOI: 10.1145/3613904.3642257

2020

Can a hand-held navigation device reduce cognitive load? A user-centered approach evaluated by 18 surgeons. C. Brendle*, **L. Schütz***, J. Esteban*, S. Krieg, U. Eck, N. Navab, Proceedings of the 23rd International Conference on Medical Image Computing and Computer Assisted Intervention–MICCAI 2020
* shared first author

Journal articles

2024

A Framework for Multimodal Medical Image Interaction. **L. Schütz***, S. Matinfar*, G. Schafroth, N. Navab, M. Fairhurst, A. Wagner, B. Wiestler, U. Eck, N. Navab, IEEE Transactions on Visualization and Computer Graphics. 30 (11), 7419-7429, 2024, DOI: 10.1109/TVCG.2024.3456163 (presented at ISMAR 2024)

2023

Audiovisual augmentation for coil positioning in transcranial magnetic stimulation. **L. Schütz**, E. Weber, W. Niu, B. Daniel, J. McNab, N. Navab, C. Leuze, Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization, 11:4, 1158-1165, 2023, DOI: 10.1080/21681163.2022.2154277 (presented at AE-CAI, MICCAI 2022)
Outstanding Paper Award

2022 — *Remote Training for Medical Staff in Low-Resource Environments Using Augmented Reality.* A. Hale, M. Fischer, **L. Schütz**, H. Fuchs, C. Leuze, Journal of Imaging 8 (12), 319, 2022

2021 — *Usability of graphical visualizations on a tool-mounted interface for spine surgery.* **L. Schütz**, C. Brendle, J. Esteban, S. Krieg, U. Eck, N. Navab, Journal of Imaging 7 (8), 159, 2021, Special Edition: "The Application of Imaging Technology in Medical Intervention and Surgery"

Awards

2023 — **MS Design Project Award**
Stanford Design, best master's project in the graduating class of 2023

2022 — **Outstanding Paper Award**
AE-CAI, MICCAI 2022

2020 — **IAUD International Design Award - Silver**
International Association for Universal Design

2020 — **TUM IdeAward - First Place (15,000 €)**
Technical University of Munich, Zeidler-Forschungs-Stiftung,
for excellence in science and entrepreneurship

2020 — **Universal Design Expert Award & Universal Design Consumer Award**
Institute for Universal Design

Scholarships

09/2023 - 08/2026 — **Doctoral Scholarship (55,800€)**
Studienstiftung (German National Academic Foundation)

09/2023 - 08/2026 — **Marianne-Plehn-Programm (40,573€)**
Bavarian State Ministry of Science and the Arts

09/2021 - 05/2023 — **ERP Scholarship ($91,400)**
German Federal Ministry of Economic Affairs and Climate Action

09/2021 - 08/2023 — **DAAD Scholarship for Study in the U.S. (36,000€)**
German Academic Exchange Service

2021 — **EXIST Business Start-up Grant (90,000€)**
German Federal Ministry of Economic Affairs and Climate Action

Teaching

Winter 23/24 & 24/25 — **Design Workshop 1**
Group of Media Informatics and Human-Computer Interaction (HCI)
Faculty of Informatics, Ludwig-Maximilians-Universität München
Introductory lecture on human-centered design, design processes & methods, prototyping, and design ethics
~ 25 graduate students in HCI, Computer Sciences (CS), or Media Informatics

Winter 23/24 & 24/25 — **Medical Augmented Reality**
Chair of Computer Aided Medical Procedures and Augmented Reality, TUM

Lectures & exercises on tracking, rendering and interaction techniques in AR
~ 40 undergraduate and graduate students in CS or Biomedical Computing

Winter 2023 — **DESIGN 231: Graduate Design Research Techniques**
Stanford d.school, Michael Barry
Lectures and discussion sections on the design thinking process with emphasis on: ethnographies, needfinding, framing and concept generation
~ 40 graduate students in Design, Business, Mechanical Engineering, or CS

Fall 2022 — **DESIGN 121: Introduction to Human Values in Design**
Stanford d.school, David Kelley
Project-based introductory course to human-centered design
~ 70 undergraduate students in the Design Program at Stanford

Spring 2022 — **DESIGN 151: Business Design: Impact and Implications**
Stanford d.school, Omar Siddiqui
Lectures and project work on business concepts, market sizing, cost estimation, P&L modeling, raising capital
~ 70 undergraduate students in the Design Program at Stanford

Winter 2022 — **DESIGN 141: Product Design Methods**
Stanford d.school, Sean Follmer
Lectures and sections on the basic concepts of human factors, cognitive and physical human capabilities, as well as usability evaluation
~ 70 undergraduate students in the Design Program at Stanford

Summer 2020 — **Industrial Design Foundations**
Chair of Industrial Design, TUM
Lectures and project work on the basics of industrial design, design history, design research, user experience, circular design, universal design
~ 40 graduate students in Human Factors Engineering, Architecture, or HCI

Professional Activities

2024 - present — **Deputy Gender Equality Officer -** Appointment Committees - TUM CIT
2024 - present — **Member of the IEEE Computer Society**
2024 - present — **Member Special Interest Group on Computer-Human Interaction (SIGCHI)**
2023 - present — **Member of the Association for Computing Machinery (ACM)**
2023 - present — **CHI, ISMAR, MICCAI Reviewer**
2022 - 2023 — **President and Co-Founder -** Stanford Women in Women's Health
2022 — **Organizing Committee Member -** Transatlantic Sync Conference at Stanford
2021- 2022 — **Organizing Committee Member -** German American Conference at Harvard

Languages and Skills

Languages — German (native), English (C2), Swedish (B2), French (A2), Spanish (A1)
Technical Skills — Python, C++, C#, C, Java, Swift, HTML, LaTeX
Applications — Unity, PyTorch, Blender, Figma, Adobe CS (e.g., Photoshop, Illustrator, InDesign), Fusion 360, Revit, Vectorworks, ArchiCAD, MS Office