University Academic Curriculum Vitae

Personal information

Name: Thomas Preindl

Education since leaving school

2024 - …, Advanced-Systems Engineering, **ongoing PhD** (Free University of Bozen-Bolzano)

2018, Interactive Media, **MSc in Engineering** (University of Applied Sciences Upper Austria, Campus Hagenberg)

2016, Medientechnik und Design, **BSc in Engineering** (University of Applied Sciences Upper Austria, Campus Hagenberg)

Professional experience and present appointment

Job title: Research Assistant
Job duration: June 2024 - ongoing

Employer:
Free University of Bozen-Bolzano

Responsibilities:

- Conducting research in the field of smart textiles and thin film sensors in the research project “Smart Cover Interfaces for the e-Vehicles and beyond”
- Cooperation with industry partners (Tratter Engineering)
- Implementation of functional prototypes
- Publications at relevant conferences

Job title: Research Associate
Job duration: November 2018 - March 2024

Employer:
Media Interaction Lab, R&D University of Applied Sciences Upper Austria

Responsibilities:

- Research in the field of smart textiles as part of the project TextileUX and EMotion.
- Publication at international conferences (UIST, CHI, TEI, ...)
- Teaching of MSc and BSc course Physical Prototyping.
- Development of prototypes for industry partners (BMW, KTM, Sefar, Elektrisola, and others)
- Close collaboration and communication with mentioned industry partners
- CAD design for prototype casings (Fusion 360)
- 3D visualisations of textile microstructures and mockups (Blender)
- Schematic and PCB layout for sensor hardware for capacitive, resistive and temperature sensors (KiCAD)
- Programming tools for generating knitting structures (JS in Visual Studio Code)
- Microcontroller programming for smart textile demonstrators (C in Visual Studio Code)

- Working with additive manufacturing, laser cutting, machining tools, sewing machine, embroidery machine, heat press, knitting machine
- Building hardware using surface mount components, reflow oven and soldering station
- Debugging hardware using oscilloscopes, signal generators, programmable power supplies and logic analyzers

Involved in following research and development projects:

TextileUX (research associate, research & development), EMotion (research associate, research & development), DigitalWerk (research associate, conceptualizing knowledge transfer events, managing deliveries), Confidential projects with industry partner BMW (research associate, research & development, managing deliveries)

Participation in exhibitions

Techtextile Kobleder fair booth, 14. – 17. May 2019, exhibition of smart textile demonstrators at textile fair in Frankfurt, Germany with industry partner Kobleder GmbH.
Constribution: development and installation on-site of capacitive and resistive textile touch sensing demonstrators (electronics and casing design, manufacturing and assembly)

ARTECH 2021 conference exhibition, 13. – 15. October 2021, Interactive textile sonic Installation demonstrating textile capacitive touch sensors with sound output in Aveiro, Portugal.
Contribution: Concept, sound design, development of electronic sensing hardware, and on-site installation of artwork.

UIST Conference Demo Session, 31. October 2022, demo session showing Knitted Pressure Sensors at UIST Conference in Bend, Oregon, USA.
Constribution: development of resistive knitted touch sensor demonstrators (electronics and casing design, manufacturing and assembly)

Fantastic Fest Cocktail Robot Exhibition 22. – 29. September 2022, Cocktail robotic exhibition with art collective Monochrom alongside film festival in Austin, Texas, USA.
Constribution: development of cocktail robot (concept, electronics, construction and assembly), demonstration at festival

(selection)

Experience in academic teaching

Course title: Design for Physical Prototyping
Date: 2021 – 2024
Institution: University of Applied Sciences Upper Austria
Subject Area: Human Computer Interaction, Electronic Prototyping
Academic level: Post-graduate MSc Interactive Media

Course title: Physical Prototyping
Date: 2023 - 2024
Institution: University of Applied Sciences Upper Austria
Subject Area: Human Computer Interaction, Electronic Prototyping
Academic level: Undergraduate BSc Media Technology and Design

Course title: Team Robot - Competencies and methods for interdisciplinary cooperation using the example of robotics projects
Date: WS 2023
Institution: Johannes Kepler Universität
Subject Area: Human Computer Interaction, Interdisciplinary cooperation, Prototyping

Memberships

ACM Membership
Membership of cultural institution DH5 in Linz, Austria

Research and scholarships

My research is focused on the development of novel textile electronic interfaces. This includes but is not limited to research on light-weight textile touch and pressure sensors manufactured through embroidery, knitting and other processes. Furthermore I work on using electronic textiles as output modality, focusing on sound.

I contributed to of following research and development projects:

Date granted	Award Holder(s)	Funding Body	Title	
November 2018	FH OOE, SoMaP, JKU; FAT Kunstuniversität Linz; TU Dresden Institute of Textile Machinery and High Performance Material Technology; BMW Group; A. Haberkorn & Co GmbH; Hexcel Composites GmbH & Co KG; Herbert Kneitz GmbH; Kobleder; KTM AG; Sefar AG; VW Group Future Center Europe GmbH	FFG COMET-Projects	TextileUX	
March 2020	FH OOE, AIT, KTM Technologies, KTM F&E, Kiska, WiVW, Salzburg research, Numerica, TU Graz, Daxner & Merl GmbH, Kobleder	BMK Climate and Energy Fund	EMotion	
March 2020	FH OOE, Creative Robotics, Fashion & Technology, Universität für künstlerische und industrielle Gestaltung Linz, LIT Robopsychology Lab, Johannes Kepler Universität Linz	BMBWF	DigitalWerk	
July 2021	FH OOE	BMW	(confidental project)	

Publications

* R. Aigner, A. Pointner, *T. Preindl*, P. Parzer, and M. Haller. 2020. Embroidered Resistive Pressure Sensors: A Novel Approach for Textile Interfaces. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3313831.3376305

A. Pointner, *T. Preindl*, S. Mlakar, R. Aigner, and M. Haller. 2020. Knitted RESi: A Highly Flexible, Force-Sensitive Knitted Textile Based on Resistive Yarns. In ACM SIGGRAPH 2020 Emerging Technologies

(SIGGRAPH '20). Association for Computing Machinery, New York, NY, USA, Article 21, 1–2. https://doi.org/10.1145/3388534.3407292

* *T. Preindl*, C. Honnet, A. Pointner, R. Aigner, J. A. Paradiso, and M. Haller. 2020. Sonoflex: Embroidered Speakers Without Permanent Magnets. In Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology (UIST '20). Association for Computing Machinery, New York, NY, USA, 675–685. https://doi.org/10.1145/3379337.3415888

* R. Aigner, A. Pointner, *T. Preindl,* R. Danner, and M. Haller, 2021. TexYZ: Embroidering Enameled Wires for Three Degree-of-Freedom Mutual Capacitive Sensing. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21). Association for Computing Machinery, New York, NY, USA, Article 499, 1–12. https://doi.org/10.1145/3411764.3445479

S. Mlakar, *T. Preindl*, A. Pointner, M. A. Haberfellner, R. Danner, R. Aigner, and M. Haller. 2022. The Sound of Textile: An Interactive Tactile-Sonic Installation. In 10th International Conference on Digital and Interactive Arts (ARTECH 2021). Association for Computing Machinery, New York, NY, USA, Article 95, 1–3. https://doi.org/10.1145/3483529.3483742

A. Pointner, *T. Preindl*, S. Mlakar, R. Aigner, M. A. Haberfellner, and M. Haller. 2022. Knitted Force Sensors. In Adjunct Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST '22 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 77, 1–3. https://doi.org/10.1145/3526114.3558656

V. Postl, W. Schwendtbauer, *T. Preindl*, and K. Probst. 2024. Mold Printer: Creating Living Self-Revealing Artworks. In Proceedings of the Eighteenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '24). Association for Computing Machinery, New York, NY, USA, Article 48, 1–12. https://doi.org/10.1145/3623509.3633396

Further competencies

Software skills (skill level):

Blender 3D (advanced)
Fusion 360 (advanced)
Tajima DG16 by Pulse (advanced)
Adobe Creative Suite - Illustrator, Photoshop, Premiere (advanced)
Microsoft Office Suite (proficient)
LaTex (proficient)
Git (proficient)
VVVV (proficient)
Visual Studio Code (proficient)
Arduino IDE (proficient)
KiCAD (proficient)
GNU Radio Companion (intermediate)

Other competences:

	Curation and organisation of International art festivals at cultural institution DH5 as part of Ars Electronica media arts festival (2021 – 2023) Amateur radio practices (Software-defined radio, visible light communication, public presentations on amateur radio)
Language competence	German (native, writing C2, speaking C2) English (fluent, writing C2, speaking C1)