

Tobias Röddiger

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Experience

Massachusetts Institute of Technology, Visiting Ph.D. Student

Boston, USA

- developing "OpenEarable", a multi-sensory in-ear platform for human-in-the-loop studies *Sep. '22 - now*
- contributing to AstroAnt, a miniature robot flying to the moon in 2023, working on the firmware and bootloader

Karlsruhe Institute of Technology, Ph.D. Student

Karlsruhe, GER

- thesis topic "Earables: Wearable Computing on the Ears", supervised by Prof. Dr. Michael Beigl *Nov. '19 - now*
- hands on development of projects in machine learning, embedded systems, and hearables (see "Selected Projects")
- published 14 papers at world-class venues incl. Ubicomp and CHI (two best paper awards, see "Selected Papers")
- leading a team of ten research assistants split into three teams and filed three patents in different fields
- working on research projects together with two industry-leading companies, overseeing budget as well as deadlines
- participated "Software Campus" which trains doctoral candidates management and leadership skills
- giving yearly practice lecture to 80+ students on mobile development and supervised 13 final thesis projects

Microsoft, Software Engineer Intern

Prague, CZ

- gathered cross-team requirements and built a telemetry library used by services across Skype *Oct. - Dec. '16*
- contributed to a new auth-token service and took responsibility for getting the service into production

encourage-now.com, Co-Founder

Karlsruhe, GER

- took responsibility for developing the enCourage cross-platform emergency app (5.000+ downloads) *Oct. '14 - Oct. '17*
- app was covered in major German news outlets (Die Welt, WiWo, Süddeutsche, Pro7, RTL II, SWR3, etc.)

Education

Karlsruhe Institute of Technology, M.Sc. Informatics

Karlsruhe, GER

- special interest in machine learning, medical informatics and design thinking *Oct. '17 - Oct. '19*
- best master thesis award 2020 "Exploring the Wearability and Design of a Fully-Integrated Sleep Tracker"

SUGAR-network.org

Multiple Locations

Design thinking project with BASF and workshops at Stanford University.

Sep. '17 - Jun. '18

- developed augmented reality app for smartphones which resulted in a meeting with the BASF CEO
- HPC cluster application with 200 nodes which reduced concept video rendering from 30 days to 30 minutes

Lancaster University, Interactive Systems, Visiting Bachelor Thesis Student

Lancaster, UK

- developed novel notification user interaction technique based on gaze (optokinetic response) *Apr. - Sep. '17*

Karlsruhe Institute of Technology, B.Sc. Informatics

Karlsruhe, GER

- special interest in ubiquitous and mobile computing, software design, and finance *Oct. '13 - Oct. '17*

Hector Seminar, part-time student

Mannheim, GER

By Hans-Werner Hector (Co-Founder SAP) to offer selected students weekly advanced lessons.

'06 - '13

- project at age 16 with University of Mannheim "Artificial intelligence for the board game Cluedo"

Selected Projects

edge-ml.org, Project Lead and Software Developer

- low-code web framework that supports the complete life cycle of tinyML models (data collection to deployment)
- implemented first version, now responsible for the vision of the open-source tool and for prioritizing new features

open-earable.teco.edu, Project Lead and Hardware Developer

- world's first open-source hardware platform for hearable research, integrates various sensors for novel applications
- designed custom PCBs of the fully-integrated hearable platform which fits behind the ear of the wearer

coronazaehler.de, Project Lead and Software Developer

- first German website to scrape COVID-19 cases from public sources, 5+ million unique visitors, 100+ million sessions
- lead programmer, ramped up and rolled out the website within one week, supports thousands of concurrent users

Skills

Soft Skills: work in fast-paced environments and quickly grasp new concepts (participated 30+ hackathons); excellent team player with the ability to lead a group to joint success; ability to prioritize tasks in complex environments while keeping the right amount of attention to critical details;

Programming: hands-on project experience in C#, Python, Java, JavaScript, C, C++, HTML, CSS

Open-Source: edge-ml.org end-to-end tinyML (project lead, 25 ★ on GitHub); GazePointHeatMap (84 ★ on GitHub)

Hardware: hearables, PCB design, embedded systems, edge machine learning / tinyML

Languages: English (fluent), German (native), French (basic)

Awards

- SICK best master thesis at KIT 2020 (“Exploring the Wearability and Design of a Fully-Integrated Sleep Tracker”)
- participated in over 30 hackathons around the globe and won 16 awards at different events
- Microsoft Imagine Cup overall winner Germany '15 and world finalist at the Microsoft HQ with Satya Nadella (CEO)
- invited student at Xamarin Evolve '16 with Nat Friedman, Xamarin Student Partner from '16 to '17
- two awards for outstanding review ACM Interactive, Mobile, Wearable and Ubiquitous Technologies Journal (IMWUT)

Scholarships

- “KIT Research Travel Grant”, awarded for research activities at Massachusetts Institute of Technology
- “DAAD IFI - International research stays for computer scientists”, resigned after acceptance

Patents

Hearables / Embedded Machine Learning (*confidential*)

Tobias Röddiger, Michael Beigl, Victor Pankratius

2021 (pending)

Discreet Hands- and Eyes-Free Input by Voluntary Tensor Tympani Muscle Contraction

Tobias Röddiger, Christopher Clarke, Michael Beigl

2021 (pending)

Sensor system, evaluation device, method and computer program product for recording a subject's sleeping behavior

Tobias Röddiger, Matthias Budde, Marcel Köpke, Michael Beigl

2018 (pending)

Selected Papers

Sensing with Earables: A Systematic Literature Review and Taxonomy of Phenomena

Tobias Röddiger et al., Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) 2022.

OpenEarable: Open Hardware Earable Sensing Platform

Tobias Röddiger et al., Proceedings of the 3rd International Workshop on Earable Computing 2022.

Best paper award: Towards Respiration Rate Monitoring Using an In-Ear Headphone Inertial Measurement Unit

Tobias Röddiger et al., Proceedings of the 1st International Workshop on Earable Computing 2019.

Detecting Episodes of Increased Cough Using Kinetic Earables.

Tobias Röddiger et al., Proceedings of the ACM Augmented Humans International Conference 2021.

Cardiopulmonary Resuscitation Support: Comparison of Wrist-, Chest-, & Ear-Worn Devices and Estimation Algorithms

S. Herrmann; P. Breitling, Tobias Röddiger et al., Proceedings of the International Symposium on Wearable Computers 2021

EarRumble: Discreet Hands- and Eyes-Free Input by Voluntary Tensor Tympani Muscle Contraction

Tobias Röddiger et al., Proceedings of the CHI Conference on Human Factors in Computing Systems 2021.

Best paper award: 3D-Printable Soft Actuators for Wearable Computing

L. Fang; Tobias Röddiger et al., Proceedings of the International Symposium on Wearable Computers 2020.