

JAN ULRICH BARTELS

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PROFILE

I am a PhD student at the International Max-Planck Research School for Intelligent Systems, working on Haptic Interfaces for Mixed Reality. Leveraging a wide variety of engineering skills, I develop electrical, mechanical and software systems that enable novel haptic experiences and benchmark them against existing solution.

EDUCATION

MAX-PLANCK INSTITUTE, Stuttgart, Germany

PhD Student, estimated completion: 2027

Areas of research: Haptic Interfaces for Augmented and Virtual Reality

Advisors: Dr. Katherine Kuchenbecker and Dr. Michael Sedlmair

THE JOHNS HOPKINS UNIVERSITY, Baltimore, MD

Masters of Science - Robotics, GPA: 3.9/4.0, May 2023

Areas of study: Haptic Interface Design, Human-Robot Interaction, Human-Computer Interaction, Augmented Reality, Control Systems Design, Robot Kinematics

OREGON STATE UNIVERSITY, Corvallis, OR

Bachelors of Science, Magna Cum Laude, GPA: 3.76/4.0, June 2017

Major: Electrical & Computer Engineering

Minor: Computer Science

RESEARCH & PROFESSIONAL EXPERIENCE

Research Assistant | Haptics and Medical Robotics Lab SEP 21 - MAY 23

The Johns Hopkins University, Baltimore, MD

- Designed and executed perceptual study for Hand Rehabilitation project, comparing vibrotactile feedback against visual feedback in patients ability to pinch virtual objects with precise forces
- Independently designed and executed haptic guidance study for novel
- Collaborated with students in the design of the 3D Hapkit and our subsequent contribution to the 2023 World Haptics Conference.
- Developed numerous circuits for sensor signal acquisition and motor control.
- Taught workshop on circuit and PCB design in KiCad for 5 lab members.

Contract Engineer

JAN 23 - MAY 23

ClearGuide Medical, Baltimore, MD

- Designed Lumina, a small-size (30cm²) interface board to interface USB 2.1 with a Texas Instruments DLP2000 micro-projector using the Infineon FX3.
- Wrote embedded C++ firmware for the FX3 and DLP2000 development board that enabled USB bulk transfer and projection of individual images.
- Established scope and oversaw execution of work by contractors and suppliers involved with projects.

Electrical Engineer

JUL 17 - JUL 2021

Biamp Systems, Beaverton, OR

- Led embedded system design for TEC-X 1000/2000 and CrowdMics platform as the project Lead Electrical Engineer.
- Designed ADC, DAC, processor (Zynq 7000, Blackfin 704), and power systems for award winning pro-Audio/Video solutions.
- Conducted hardware bringup and benchmarked project's audio performance (SNR, DR, THD, Crosstalk, Output Power).
- Ushered product through EMC testing and adjusted circuits to FCC standards.
- Managed a team of 6 engineers during the pandemic to address component shortages caused by the global supply chain disruption.

Hardware Engineering Intern

SEP 16 - FEB 17

Biamp Systems, Beaverton, OR

- Designed the schematic combining Audinate's Dante Network audio card with the Biamp Tesira Forte platform to create the Flagship Forte DAN product.
- Re-designed POTS interface on the Tesira Server STC-2 card to address EOL of the high-voltage isolation interface and upgrade processor to ADSP-BF704.
- Wrote C firmware for ADSP-BF704 to toggle LEDs on new STC-2 card to verify operation of the processor.

Teaching Assistant | Data Structures

SEP 15 - JUN 17

College of Engineering, Oregon State University

- Taught time and space behavior of stacks, queues, linked list and binary trees, big O notation, sorting algorithms and memory management
- Graded students homework, exams, and drafted grading rubrics

VLSI Engineering Intern

MAR 15 - AUG 15

Intel, Hillsboro, OR

- Developed Verilog module to monitor requests between CPU core and memory logic and check for proper execution
- Worked with engineers to integrate module into a larger testbench for next generation Xeon Phi processors.

PUBLICATIONS **Demo & WIP:** H. Zhang, **J. Bartels**, J.D. Brown "*3D Hapkit: A Low-Cost, Open-Source, 3-DOF Haptic Device Based on the Delta Parallel Mechanism*", World Haptics Conference 2023

Paper: G. Zhang, **J. Bartels**, A. Gomez, M. Armand, "*Towards Reducing Visual Workload in Surgical Navigation: Proof-of-concept of an Augmented Reality Haptic Guidance System*", AE-CAI 2022

ADVISING & MENTORSHIP**Katherine Peng** JHU ECE Undergraduate

F' 2022 - S' 2023

*Polaris: STM32F107 based, PoE+ enabled, ArtNet capable, LED controller***Ting Li** JHU ECE Undergraduate

F' 2022 - S' 2023

*Polaris: STM32F107 based, PoE+ enabled, ArtNet capable, LED controller***SKILLS****Programming:** Embedded C, C++, Python, MATLAB**Electrical Design:** Motor control (Servo, BLDC, Brushed), Sensor interfaces, Signal processing, Power conversion (isolated & non-isolated), Embedded Design (schematic capture, layout, hardware bringup, DFM), Network interfaces (10/100 Ethernet)**Software:** KiCad, Altium, LTSpice, OpenSCAD, Arduino, MATLAB