

Jianwei Sun

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🌐 jianwei-sun.github.io

in /jianwei-sun

Education

UCLA | Los Angeles, CA

Ph.D. & M.Sc. in Systems and Control

Sept 2019 - 2024 (Expected)

Cumulative GPA: 3.98/4.0

ETH Zürich | Zürich, Switzerland

M.Sc. in Electrical Engineering

Sept 2017 - Sept 2019

Cumulative GPA: 5.71/6.0

University of Toronto | Canada

B.A.Sc. in Engineering Science (ECE)

Sept 2012 - June 2017

Cumulative GPA: 3.79/4.0

Publications

Suppressing Delay-Induced Oscillations in pHRI with an Upper-Limb Exoskeleton using Rate-Limiting

Oct 2022, (IROS)

Sensor Reduction, Estimation, and

Control of an Upper-Limb Exoskeleton

Feb 2021, (RA-L)

Vehicle Platoon Control with Virtual Path Constraints

Aug 2019, (CCTA)

Admittance Control Scheme

Comparison of EXO-UL8: A Dual-Arm

Exoskeleton Robotic System

June 2019, (ICORR)

Synthesis of a Multi-beam Dual

Reflectarray Antenna using Genetic

Algorithms

July 2017, (APS)

Skills

Programming

C/C++, Python, MATLAB, Git, Linux

Software

MuJoCo, Simulink, Altium, LTSpice,

SolidWorks

Hands-on

Soldering, hardware validation, circuit

debugging, prototyping

Work Experience

Skydio | Autonomy (Internship)

June 2022 - Sept 2022 | San Mateo, CA

- Evaluated feasibility of an emergency three-rotor recovery landing
- Implemented and tested an IMU-based reduced-attitude controller and dynamically feasible optimal braking and landing trajectories

Apple | Wearable Systems (Internship)

Sept 2018 - Feb 2019 | Cupertino, CA

- Designed a drop-in test SIP for the Apple Watch to quantify coexistence issues in system form-factor
- Created software toolchain for automated data extraction and analysis

Intel | Programmable Solutions (Internship)

June 2017 - Sept 2017 | San Jose, CA

- Developed interfaces for PCIe-based H264 video encoder FPGA

Apple | Wearable Systems (Internship)

May 2015 - May 2016 | Cupertino, CA

- Developed a generic hardware validation platform and fault-tolerant software to stress-test a sensor subject to unpredictable failures
- Successfully identified a rare reliability failure mode and aided cross-functional teams in arriving at a mass-producible solution

Research Experience

University of California, Los Angeles (UCLA)

Feb 2019 - Present | Bionics Lab

- Developed open-source safety-focused admittance control library for physical human-robot interaction with serial manipulators. ([Github](#))
- Investigated holonomically constrained admittance control using feedback-linearization with applications in robot-assisted rehabilitation
- Implemented a nonlinear joint-space controller for dynamics compensation of a Harmonic drive-actuated exoskeleton
- Developed a Kalman filter-based sensor fusion method to achieve similar human-exoskeleton transparency with a subset of sensors
- Implemented a rate-limiting filter to suppress unstable human-induced oscillations due to physiological and mechanical time delays

Swiss Federal Institute of Technology (ETH Zürich)

Feb 2018 - Aug 2018 | Institute for Dynamic Systems and Control

- Developed a distributed admittance controller for human-robot interaction with a path-constrained quadrotor platoon

Oct 2017 - Feb 2018 | Computer Engineering and Networks Laboratory

- Developed a radio-based ultra low power ($\sim 10 \mu\text{W}$) clock synchronizer with nanosecond precision for wireless IoT devices

May 2016 - Aug 2016 | Institute for Dynamic Systems and Control

- Characterized brushless motor dynamics for quadrotors

University of Toronto

Sept 2016 - June 2017 | Reconfigurable Antenna Laboratory

- Developed a genetic algorithm-based optimizer for beam synthesis on a Cassegrain reflectarray antenna system