Jianwei Sun

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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 Tools
Eigen, MuJoCo, CMake, GitHub, Simulink
SolidWorks
Hands-on
Hardware validation, prototyping, circuit debugging, soldering

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 (~10 μW) 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