Jianwei Sun

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Education

UCLA | Los Angeles, CA
Ph.D. & M.Sc. in Systems and Control
Sept 2019 - Mar 2024
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

Select Publications

Virtually Constrained Admittance Control using Feedback Linearization for pHRI with Rehab. Exoskeletons
2024, (TMECH)

A Safety-Focused Admittance Control Approach for pHRI with Rigid Multi-Arm Serial Link Exoskeletons
2024, (TMECH)

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)

Skills

Programming
C/C++, Python, MATLAB, Git, Linux
Software Tools
Eigen, Boost, MuJoCo, CMake, Bazel
Hands-on
Hardware verification, circuit design, prototyping, 3D printing, soldering

Work Experience

Skydio
June 2024 - Present | Autonomy Engineer
- Implementing improvements to quadrotor planner and controller

June 2022 - Sept 2022 | Autonomy Intern
- Evaluated feasibility of a quadrotor IMU-based three-rotor controller
- Implemented and verified dynamically generated feasible optimal braking and landing trajectories

Apple
Sept 2018 - Feb 2019 | Wearable Systems Intern
- Designed a drop-in test SIP for the Apple Watch to quantify RF coexistence issues in system form-factor
- Created software toolchain for automated data extraction and analysis

May 2015 - May 2016 | Wearable Systems Intern
- Developed a generic hardware validation platform and fault-tolerant software to stress-test sensors subject to unpredictable failures
- Successfully identified a rare reliability failure mode and aided cross-functional teams in arriving at a mass-producible solution

Intel
June 2017 - Sept 2017 | Programmable Solutions Intern
- Developed interfaces for PCIe-based H.265 video encoder FPGA

Research Experience

University of California, Los Angeles (UCLA)
Feb 2019 - Present | Bionics Lab
- Developed open-source safety-focused admittance control library for pHRI with real-time collision avoidance (Github)
- Investigated holonomically constrained admittance control using feedback linearization for robot-assisted rehabilitation
- Implemented joint-space controller with symbolic dynamics
- Developed a Kalman filter-based sensor fusion method to achieve comparable human-exoskeleton transparency with a subset of sensors
- Investigated rate-limiting to suppress human-induced instability

Swiss Federal Institute of Technology (ETH Zürich)
Feb 2018 - Aug 2018 | Institute for Dynamic Systems and Control
- Developed a distributed admittance controller for pHRI with a path-stabilized quadrotor platoon using transverse feedback linearization

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 DC 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