Hui Xiao

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SUMMARY

I'm a Ph.D. student researches in robot control. I have a strong academic background in control system design, signal processing, state estimation. I also worked on projects in computer vision, machine learning and deep learning. I'm a quick learner passionate about the robot and automation technology.

EDUCATION

Sep 2019 – (Jan 2021)	**Mechanical Engineering | University of Washington**	Seattle, WA, USA
	Doctor of Philosophy (Ph.D.)	GPA:3.8/4.0
Aug 2015 – May 2019	**Mechanical Engineering | University of Connecticut**	Storrs, CT, USA
	Doctor of Philosophy (Ph.D.)	GPA: 4.0/4.0
Sep 2011 – July 2015	**Mechanical Engineering | Tsinghua University**	Beijing, China
	Bachelor of Science (B.S.)	GPA: 88.9/100

EXPERIENCE

Jun – Aug 2019 **Applied Scientist Intern | Amazon** Seattle, USA

- Developed and tested machine learning models for better understanding unrecognized customer's destination.

2015 – present **Research Assistant | Machine, Automation and Control System Laboratory** Storrs & Seattle, USA

- Conduct state-of-art research in vision-based robot control; developed a novel sensor fusion and visual servoing algorithm that enables control of fast-moving robot under delayed and slow visual feedback.

2015 – 2018 **Teaching Assistant | University of Connecticut** Storrs, USA

SELECTED PROJECTS

2019 Fall **Toro-Tile-Straight AI Agent Player** Seattle, USA

- Programed an AI agent for the Toro-Tile-Straight game (a competitive board game).
- Ranked 2/85 among all other AI agents in a class-wide competition.

2019 Spring **Target Following under Slow and Delayed Visual Feedback** Storrs, USA

- Developed an enhanced visual servo algorithm for tracking targets with fast-dynamics movement, but the vision feedback is slow and delayed. The Algorithm was tested in a robot platform with two arms and eye-in-hand cameras. (Keywords: **vision-based robot control**, **signal processing**)

2018 Fall **Automated Rubik's Cube Robot Solver** Storrs, USA

- Coded a dual-arm robot (with ROS and OpenCV) so that it can automatically inspect and solve a random scrambled Rubik's cube. (Keywords: **Color Detection**, **Robot trajectory planning**)

2018 Spring **IMM Estimator for Air Traffic Control** Storrs, USA

- On-line estimation of the position, velocity, and course of an airplane from radar measurements using the interacting multiple model (IMM) and Extended Kalman Filter (EKF). (Keywords: **Estimation**, **Tracking**)

2017 Fall **Semantic Image Segmentation for Airplanes Using CNN** Storrs, USA

- Trained a 27-layer convolutional neural network (CNN) that can segment airplanes in an image. (Keywords: **Deep learning**, **Image processing**)

Senior Design **Pose Estimation for Human Upper Limb and Control of Robotic Arm and Hand** Beijing, China

- Designed an upper arm posture estimation algorithm by fusion measurements from three wearable IMUs and five resistive flex sensors. The algorithm is used to remotely control a robotic arm and hand.

SELECTED COURSES

CSE-415 **Introduction to Artificial Intelligence**	Instructor: **Steve Tanimoto**	Grade: **A**
ECE-6439 **Estimation Theory and Computational Algorithms**	Instructor: **Yaakov Bar-Shalom**	Grade: **A**
ECE-6122 **Digital Signal Processing**	Instructor: **Peter Willett**	Grade: **A**
ECE-6171 **Mobile Robotics**	Instructor: **Ashwin Dani**	Grade: **A**
ME-5160 **Theory and Design of Automatic Control**	Instructor: **Nejat Olgac**	Grade: **A+**
ME-5895 **Adaptive and Optimal Controls**	Instructor: **Xu Chen**	Grade: **A**
Deep Learning Specialization on Coursera	Instructor: **deeplearning.ai**	Grade: **99/100**

RECOGNITIONS

Best Student Paper on Robotics Award, ASME Dynamic System and Control Division	2019
First Place, ME Graduate Research Competition, University of Connecticut	2019
Best Student Paper on Mechatronics Award, ASME Dynamic System and Control Division	2018
Best Vibrations Paper Award, ASME Dynamics Systems and Control Conference	2017
First Prize Award, The "Challenge Cup" Student Research & Technology Competition, Tsinghua University	2014
Undergraduate Laboratory Contribution Award, Tsinghua University	2014
Science and Technology Innovation Fellowship, Tsinghua University	2013&2014
First Prize Award, Excellent Student Research Project, Tsinghua University	2013
Second Prize Award, Mechanical Innovation Competition, Tsinghua University	2012

COLLEDGE ACTIVITIES

July 2013 - July 2014	**Vice President,** Student Association for Science and Technology, Department of Mechanical Engineering, Tsinghua University
Feb 2013 - July 2013	**Vice Minister**, Student Union, Department of Mechanical Engineering, Tsinghua University

SELECTED PUBLICATIONS

[1] Hui Xiao, Xu Chen. "Following Fast-Dynamic Targets with Only Slow and Delayed Visual Feedback— A Kalman Filter and Model-Based Prediction Approach." **In Proceedings of ASME 2019 Dynamic System and Control Conference,** Oct. 9, Park City, USA, 2019. (**Best Student Paper on Robotics**)

[2] Hui Xiao, Yaakov Bar-Shalom, Xu Chen. "A Collaborative Sensing and Model-Based Real-time Recovery of Fast Data Flows from Sparse Measurements." **IEEE Transactions on Industrial Electronics** (2019).

[3] Hui Xiao, Tianyu Jiang, Xu Chen. "Rejecting fast narrow-band disturbances with slow sensor feedback for quality beam steering in selective laser sintering." **Mechatronics** 56 (2018): 166-174.

[4] Hui Xiao, Ioan D. Landau, Xu Chen. "A robust optimal design for strictly positive realness in recursive parameter adaptation." **International Journal of Adaptive Control and Signal Processing** 31.8 (2017): 1205-1216.

[5] Hui Xiao, Xu Chen. "Multi-band beyond Nyquist Disturbance Rejection on a Galvanometer Scanner System." **IEEE International Conference on Advanced Intelligent Mechatronics**, Munich, Germany. 2017. (**Best Student Paper on Mechatronics)**

[6] Xu Chen, **Hui Xiao. "**Multirate Forward-model Disturbance Observer for Feedback Regulation beyond Nyquist Frequency". **In Proceedings of American Control Conference**, Boston, USA, 2016.

SKILLS

C++, Python, MATLAB, OpenCV, Robotic Operating System (ROS), TensorFlow, SQL, Spark, CAD