# Jason Xie

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## EDUCATION

**UNIVERSITY OF WASHINGTON**
BS, Electrical Engineering
Sept 2019 - Dec 2021 | Seattle, WA

## COURSEWORK

### GRADUATE

- Probabilistic Robotics
- Machine Learning
- Reinforcement Learning
- Numerical Linear Algebra
- Convex Optimization Algorithms
- Talking to Robots

### UNDERGRADUATE

- Continuous-Time Linear Systems
- Discrete-Time Linear Systems
- Control Systems Analysis
- Algorithms and Complexity
- Numerical Analysis
- Probability and Inference
- Data Structures
- Circuit Theory
- Hardware / Software Interface
- Design Methodology

### IN-PROGRESS

- Computer Vision (Graduate)
- Dynamical Systems (Graduate)
- Random Processes (Graduate)
- Digital Imaging Systems

## SKILLS

Proficient:

- Python, MATLAB, Java
- Unix (Linux), Git
- Mandarin Chinese

Familiar:

- C / C++, R
- ROS, PyTorch, OpenCV

## RECOGNITION

- 1st/50, EE 341. DT Linear Systems
- Dean's List, Engineering (x1)

## INTERESTS

- Education (Teaching, Outreach)
- Art (Drawing, Painting, Design, 3D)
- Music (Alto Sax, Arrangement)

## EXPERIENCE

### UW ROBOTICS & STATE ESTIMATION LAB - Research Assistant

Nov 2019 - Apr 2020 | Seattle, WA

- Project: Unsupervised learning of interpolatable disentangled representations for visual trajectory generation and goal-directed task planning from raw pixels
- Simulated object physics with PyBullet and OpenCV for training data generation
- Implemented custom deep convolutional (CNN) encoder-decoder networks with PyTorch; investigated network architecture ablations with bilinear additive upsampling, CoordConv, variational autoencoders (VAE)
- Proposed and evaluated loss functions, model parameters, and training procedures for inducing interpretable latent structure via gradient-based optimization

### UC BERKELEY EECS - Reader, CS 194/294-129. Deep Learning

Jan 2018 – May 2018 | Berkeley, CA

- Assisted course staff in design and TensorFlow implementation of homework assignment applying deep neural networks to natural language processing (NLP)
- Topics: recurrent neural networks (RNN), word embeddings (word2vec), machine translation with attention (seq2seq), end-to-end memory networks (MemN2N)

## PROJECTS

### ROCKET TRAJECTORY OPTIMIZATION

Apr 2020 - Jun 2020 | Machine Learning, Control Systems

- Designed controllers for 2D soft spacecraft landing in the LunarLander-v2 OpenAI Gym environment using deep reinforcement learning (DQN, DDPG)
- Evaluated design considerations and performance between learning control policies with precise vs. visually estimated states (via Kalman Filtering), discrete vs. continuous action spaces in the context of signals and systems theory

### PROBABILISTIC IMAGE DENOISING

Oct 2019 - Nov 2019 | Image Processing, Computational Statistics

- Implemented approximate inference algorithm for removing noise from corrupted images via Markov chain Monte Carlo (MCMC) sampling conditioned on an Ising Markov Random Field (MRF) and a Gaussian noise observation model

### GITLET

Jul 2018 | Software Engineering

- Implemented file tracking version control system from Java data structures
- Supported functions (modelled after Git): init, add, commit, rm, log, find, status, checkout, branch, reset, merge

### BARC - BERKELEY AUTONOMOUS RACE CAR

Feb 2018 - May 2018 | Control Systems, Robotics

- Performed dynamics modeling and system identification (acceleration, braking, steering, tire slipping) for ROS / Arduino interfaced 1/10th scale model car
- Experimentally fit model parameters from sensor and actuator data (IMU, optical wheel encoders, PWM motors and servos)
- Designed controllers (PID, LQR) for cruise control, camera-based lane keeping (inertial frame trajectories generated real-time with OpenCV), open-loop drifting

## ACTIVITIES

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|---|---|---|
| Aug 2020 - Present | BSEE Representative | UW ECE Curriculum Committee |
| Aug 2018 | Group Mentor | AI4All BAIR Camp 2018 |
| Oct 2017 - May 2019 | Volunteer | Lawrence Hall of Science |