

Shengyi “Costa” Huang

SUMMARY

- CS Ph.D. student in Deep Reinforcement Learning (DRL) with 2+ years of in-depth research.
- Proficient in Python, Numpy, Pytorch for building Machine Learning models.
- Authored a DRL library CleanRL with algorithms such as Deep-Q Networks and Proximal Policy Gradient. Received 340+ upvotes from Reddit and 242+ stars from Github.
- Streamline experiment version management that keeps tracks of 5,000+ experiments with logging of hyper-parameters and important metrics. Selected example see <https://benchmark.cleanrl.dev>.

EDUCATION

Ph.D. in Computer Science

Drexel University, Philadelphia, PA

Expected Jun 2023

- Advisor: Dr. Santiago Ontañón
- Research Area: Game Artificial Intelligence with Deep Reinforcement Learning

B.S in Computer Science, B.S in Mathematics

Furman University, Greenville, SC

May 2018

EXPERIENCE

Ph.D. Student

Drexel University, Philadelphia, PA

Sep 2018 – Present

- Design the first DRL library that displays complete hyper-parameters, training metrics, and exact commands to reproduce experiments in a dashboard, bringing reproducibility to a new level.
- Create scalable DRL infrastructure that is cloud-friendly (e.g. we are able to leverage AWS Batch and Docker to finish 8,000+ CPU hours of tasks within 4 hours).
- Develop new DRL algorithms and techniques for Real-time Strategy Games to improve sample-efficiency in large discrete action spaces.

Graduate Research Assistant

Drexel University, Philadelphia, PA

Sep 2019 – Jun 2020

- Utilized Dynamic Bayesian Network (DBN) infer players' intentions in Real-time Strategy Games.
- Used the trained DBN to synthesize potential game states to help the strategy planner.
- Communicated and presented our findings to the funding agency for fast iteration on experiments.

Graduate Teaching Assistant

Drexel University, Philadelphia, PA

Sep 2018 – Jun 2019

- Tutored 30+ students with Python and Java lab assignments, and collaborated with them and gave advice on their final projects.
- Graded 200+ students' homework and provided detailed feedback.

Backend Developer

Carely, Inc., Greenville, SC

Jun 2018 – Sep 2018

- Developed the API server using Go and MySQL that serves 10,000+ users.
- Perfected the development environment by using Docker to enable cross-platforms reproducibility.
- Automated API test workflow by using OpenAPI (Swagger).
- Coordinated with the team of 5 people through Jira, Slack, Github.

Computing in Community Developer

Furman University, Greenville, SC

Oct 2017 – Feb 2018

- Developed an application for the commencement of 200+ graduating students.
- Collaborated with the university registrar and IT department for logistical setups.
- Utilized Go and Algolia to build real-time search of student's profiles.

Teaching Assistant

Furman University, Greenville, SC

Aug 2017 – Dec 2017

- Tutored 30+ students on Web Programming topics: JavaScript, VueJs, Webpack, Vuetify, AWS, PHP, Go, MySQL, Docker, REST API, Python, and Laravel.
- Helped the professor with preparing lab materials with respect to the latest tools and projects.
- Collaborated with the professor to create the course website using the latest front-end tools.

Research Fellow

Furman University, Greenville, SC

Jun 2017 – Aug 2017

- Authored a Python package, StreetTraffic, that collects more than 100 GBs of traffic flow data.
- Worked with Dr. Chirs Healy to conduct research on travel plan recommendations.
- Set up proper unit-tests and documentation by using Sphinx.

PROJECTS

(2019) CleanRL

High-quality single file implementation of Deep Reinforcement

Learning algorithms with research-friendly features

benchmark.cleanrl.dev

• Python

★ 242

(2019) Gym-MicroRTS

The OpenAI Gym wrapper for MicroRTS for DRL research

github.com/vwxyzjn/gym-microrts

• Python

★ 18

(2018) Portwarden

Create Encrypted Backups of Your Bitwarden Vault with Attachments

github.com/vwxyzjn/portwarden

• Go

★ 179

(2017) StreetTraffic

Collects the traffic flow data of your favorite routes and cities

streettraffic.org

• Python

★ 14

(2017) SC2AI

Integrated Tensorforce and OpenAI Gym to train SC II game agents

costa.sh/SC2AI

• Jupyter Notebook

★ 12

SKILLS

Python, Pytorch, Tensorflow, Numpy, Git, Linux, Statistics, Go, Docker, JavaScript, SQL.

PUBLICATIONS

Huang, S., Ontañón, S., “Action Guidance: Getting the Best of Training Agents with Sparse Rewards and Shaped Rewards”, *in review for AIIIDE Strategy Games Workshop*, August 2020

Dossa, R., **Huang, S.**, Ontañón, S., Matsubara, T., “An Empirical Investigation of Early Stopping Optimizations in Proximal Policy Optimization”, *in review for NeurIPS 2020*, June 2020

Huang, S., Ontañón, S., “A Closer Look at Invalid Action Masking in Policy Gradient Algorithms”, *preprint; to be submitted to ICLR 2021*, June 2020

Huang, S., Ontañón, S., “Comparing Observation and Action Representations for Reinforcement Learning in μ RTS”, *AAIIDE Strategy Games Workshop*, October 2019

Huang, S., Grethlein, D., “Generating Interpretable Class Model Visualizations for CNNs with Varying Dilation Factors”, *preprint*, June 2019

Huang, S., Healy, C., “StreetTraffic: a Library for Traffic Flow Data Collection and Analysis”, poster presentation in *ACMSE 2018 Conference*, March 2018

RELEVANT COURSES

Artificial Intelligence, Machine Learning, Computer Vision, Computer Graphics, Algorithmic Game Theory, Software Design, Statistics, Probability, Linear Algebra, Real Analysis, Abstract Algebra, Fundamentals of Databases, Developing User Interfaces