Shengyi "Costa" Huang

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QUALIFICATION SUMMARY

- CS Ph.D. student in (DRL) Deep Reinforcement Learning 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://cleanrl.costa.sh.

EDUCATION

Drexel University, Philadelphia, PA

Ph.D. in Computer Science   **Expected Jun 2023**

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

Furman University, Greenville, SC

B.S in Computer Science   **May 2018**
B.S in Mathematics

EXPERIENCE

Drexel University, Philadelphia, PA

Researcher at Games, Artificial Intelligence and Media Systems Laboratory   **Sep 2018 – Present**

- Read and reproduce the state-of-the-art on Deep Reinforcement Learning (DRL) algorithms.
- Develop new DRL algorithms and techniques for Real-time Strategy Games.
- Maintain a DRL library CleanRL with 7+ DRL algorithms implemented (DQN, PPO, SAC, TD3, and others) and benchmarked in 34+ games (Atari, Mujoco, and others.).
- Design 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).

Graduate Research Assistant   **Oct 2019 – Present**

- Utilize Dynamic Bayesian Network (DBN) infer players' intentions in Real-time Strategy Games.
- Use the trained DBN to synthesize potential game states to help the strategy planner.
- Communicate and present our findings to the funding agency and do fast iteration on experiments.

Graduate Teaching Assistant   **Sep 2018 – Jun 2019**

- Tutored students with Python and Java lab assignments for 10+ hours a week.
- Collaborate with students and give advice on their final projects.
- Graded students' homework and provided detailed feedback.

Carely, Inc., Greenville, SC

Backend Developer   **Jun 2018 – Sep 2018**

- Developed the API server for the web and mobile platforms by using Go and MySQL.
- Perfected the development environment cross-platforms by using Docker.
- Coordinated with the team through Jira, Slack, Github, and OpenAPI(Swagger).

Furman University, Greenville, SC

Computing in Community Deveoper   **Oct 2017 – Feb 2018**

- Developed an application that collects the pronunciation of student names for the commencement.
- Collaborated with the university registrar and IT department.
- Utilized Go and Algolia for back-end to build interactive search.

Teaching Assistant **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 **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

(2018) Jupyter Disqus

Add Disqus to Jupyter Notebook

github.com/vwxyzjn/jupyter_disqus   • Python   ★ 12

(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., "A Closer Look at Invalid Action Masking in Policy Gradient Algorithms", *preprint*, October 2019

Huang, S., Ontañón, S., "Comparing Observation and Action Representations for Reinforcement Learning in μRTS", *AIIDE Workshop on Artificial Intelligence for Strategy Games*, 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