Shengyi "Costa" Huang

(864)501-6630
COSTA.HUANG@OUTLOOK.COM
GITHUB.COM/VWXYZJN
LINKEDIN.COM/IN/COSTA-HUANG
WWW.COSTA.SH

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 Researcher
GAIMS Lab, 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 (RTS) games to improve sample-efficiency in large discrete action spaces.

Graduate Research Assistant
Drexel University, Philadelphia, PA **Sep 2019 – Jun 2020**

- Experimented with Dynamic Bayesian Network (DBN) to infer players' intentions in RTS games, which could significantly improve the agents' ability to counter opponents' strategy.
- Interfaced communication between Java and Python to incorporate more powerful data analysis library and machine learning tools.
- Communicated and presented our findings to the funding agency regularly for Agile Development.

Graduate Teaching Assistant
Drexel University, Philadelphia, PA **Sep 2018 – Jun 2019**

- Tutored 30+ students with Python and Java lab assignments.
- Graded 200+ students' homework and provided detailed feedback.
- Provide useful resources and instructions for students' final projects.

Backend Developer
Carely, Inc., Greenville, SC **Jun 2018 – Sep 2018**

- Developed the API server using Go and MySQL that served 10,000+ users.
- Perfected the development environment by using Docker to enable cross-platforms reproducibility.
- Automated API test workflow by using OpenAPI (Swagger).

Software 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　　　　　　　　★ 262

(2019) Gym-MicroRTS
The OpenAI Gym wrapper of MicroRTS for DRL research

github.com/vwxyzjn/gym-microrts　　　● Python　　　　　　　　★ 19

(2018) Portwarden
Create Encrypted Backups of Your Bitwarden Vault with Attachments

github.com/vwxyzjn/portwarden　　　　● Go　　　　　　　　　★ 184

(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", *accepted to AIIDE 2020 Strategy Games Workshop*

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

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

Huang, S., Ontañón, S., "Comparing Observation and Action Representations for Reinforcement Learning in μRTS", *AAIIDE 2019 Strategy Games Workshop*

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*

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