Yunzhe Wang

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EDUCATION

Columbia University *New York, NY*

M.S. Computer Science, Machine Learning Specialization, GPA 3.83 *2021 – Present*

University of Southern California *Los Angeles, CA*

B.S. Computational Neuroscience; B.A. Applied Mathematics; Minor in Computer Science *2017 – 2021*

GPA 3.84, magna cum laude, Phi Beta Kappa (honors society), Dean's List, USC Academic Achievement Award

- Coursework: Artificial Intelligence(A), Applied Machine Learning for Games(A), Robotics(A), Algorithms(A), Data Structure(A), Numerical Methods(A), Statistics(A), Probability(A), Optimization(A), Mathematics of Machine Learning(A), Cognitive Neuroscience(A), Neurobiology(A), Sensation and Perception(A)

EXPERIENCE

Creative Machine Lab, Columbia University *New York, NY*

Student Researcher *Sept 2021 – Present*

- Multimodal learning Research with Prof. Hod Lipson: Lip synchronization on humanoid robot face
- Collaborated with the research team of 9 people to integrate ideas into products with Deep Learning Solutions
- Created and implemented the whole learning pipeline, keep technical documentation and agenda up to date
- Designed a sample efficient conditional WGAN deep learning architecture, trained on ~6000 videos in VoxCeleb2
- Initiated data analysis and pre-processing such as face alignment to reduce training time within 15 mins

Cognitive Architecture Lab, USC Institute for Creative Technologies *Los Angeles, CA*

Student Researcher *May 2020 – Aug 2021*

- Reinforcement Learning and Route Optimization research with Prof. Paul Rosenbloom and Research Associate Volkan Ustun in programs AGENTS with Theory of Mind for Intelligent Collaboration (ATOMIC) and DARPA ASIST
- Created and co-developed an MDP semantic graph environment using the OpenAI Gym and NetworkX module
- Led Reinforcement Learning experiments using DQN and PPO for Search-and-Rescue (SAR) route optimization
- Co-developed Mixed-Integer Programming (MIP) models for SAR route planning utilizing Google OR-Tools
- Led and Dev. Sequential Decision-making Framework by modifying the Transformer Archit. for multi-agent SAR
- Well-documented the research project and mentored the next student to take over the project.

Publication

- *Neural Heuristics for Route Optimization in Service of a Search and Rescue Artificial Social Intelligence Agent* Y. Wang, N. Gurney, J. Zhou, D. Pynadath, V. Ustun. Accepted to AAAI 2021 FSS (in-press)

Volunteer *Mar 2020 – June 2020*

- Developed Web App (user interface design and API integration) for visualizing and debugging (Py)Sigma Model
- Literature review on Graphical Model, constructed ~300 Unit-Testing cases, Bayesian Model Testing

SKILLSET

Programming Languages: Python (5 years); C++, Java, SQL, HTML, CSS, JavaScript (3 years); MATLAB (2 years); PHP (1 yr)
Tools: PyTorch, Pandas, scikit-learn, Matplotlib, NLTK, Git, LaTeX, Linux, Unity, React.js, Django, Neo4j, MongoDB, Gatsby
Algorithms: NLP (Grade A), Deep Learning, Reinforcement Learning, Regression, Clustering & Classification, DP, PID
Others: Sketching (>10 years), Landscape Photography, Photoshop, Premiere, Bilingual (English & Chinese), Blender

PROJECTS

Image Captioning Seq2Seq Modeling (NLP, LSTM with Attention, Beam Search, BLEU evaluation) *Nov 2021*
Autonomous Driving Race Car Game Agent (Reinforcement Learning, Simulation, Control, Sensing) *Jan 2021 – May 2021*
DIY CNC Machine for Drawing and Writing (G-Code, Image tracing, Control) *Dec 2020 – Jan 2021*
Delivery Robot Cooperate with Robotic Arm (Pathfinding, Localization, Manipulation, Simulation) *Apr 2020*
Chinese Part-of-Speech Tagging Research (Expert System, Data Mining, Distributed Computing) *June 2019 – Aug 2019*
Non-profit Game Server Owner & Dev. (Res. Mgmt., Java Plugin, Web Dev., Distributed System) *May 2019 – Present*
Scrabble Word Game Artificial Intelligence Project (Tries, Heuristic Search, Pruning) *Nov 2018 – Dec 2018*
Quant Investment Modeling Competition (Leader, Championship, Web Scraping, Data Analysis, Regression) *Aug 2018*