

Yijie (EJay) Guo

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Portfolio: ejayguo.github.io

Highlights

Interested in Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), Computer Vision (CV) and Graphics. 2-years' experience each in AI and ML research, full-stack web development and game development.

Educations

- Master of Science in Applied Computing** **University of Toronto** **Sept 2021 - Dec 2022 (Exp)**
Courses: Deep Learning, Trustworthy ML, Tools & Techniques for ML, Foundations of ML, etc.
Scholarship: The Vector Scholarship in Artificial Intelligence.
- Bachelor of Science in Computer Science** **University of Utah** **Jan 2016 - May 2019**
Courses: AI, ML, Computer Graphics, Image Processing, Web Architecture, Database Systems, Data Mining, etc.
Scholarship: The Wilford and Dana Druk Scholarship.
Grade: GPA 3.99 / 4.00, Graduated with **Summa Cum Laude**. Dean's List from Spring 2016 to Spring 2019.
- Bachelor of Science in Economics** **Shanghai University** **Sept 2007 - Jul 2011**

Research Experience

- Trustworthy ML Project** **University of Toronto, Ontario, Canada** **Sept 2021 – Dec 2021**
Training Data Reconstruction/Stealing from Black-box Models [Python, Pytorch, Jupyter, ML, DL]
 - Created a data-free method for reconstructing training data of neural networks in black-box settings.
 - Modified a new energy-based Generative Adversarial Network (GAN) to synthesize training data.
 - Formulated a distance-free clustering method extracting most significant features in the latent space.
 - Successfully recreated several visually identifiable digits of the MNIST dataset from black-box models.
- Research Assistant** **University of Utah, Utah, USA** **May 2018 – June 2020**
Shape Anomaly Analysis [Python, Pytorch, Jupyter, ML, DL, Computer Graphics, Medical]
 - Built Shape Normality Metric for modeling normal skulls and identifying abnormal ones via neural networks.
 - Integrated the ML pipeline for 3D data transformation, data engineering and model deployment.
 - Tuned and tested hyper parameters via cross validations and achieved 85 - 95% accuracy.***Unmanned Aircraft Systems (UAS) and UAS Traffic Management (UTM) [C++, AI, Robotics, Simulation]***
 - Coded the lane-based strategic deconfliction algorithm and passed formal verifications.
 - Visualized UAS traffic in the UTM network and optimized the UAS network's speed and throughput.***Probabilistic Knowledge Base Implementation [Python, Matlab, ML, CV]***
 - Created an automation DL system detecting and recording videos with single moving object from a live camera.
 - Extracted objects' sizes, colors and shapes as features using image processing techniques.
 - Trained and converted a Decision Tree (DT) to a Probabilistic Knowledge Base (KB).
 - Proved the converted KB was the original DT in explainable format with the same 95% classification accuracy.

Software Development Experience

- ML Engineer & Full-stack Developer** **University of Utah, Utah, USA** **Mar 2019 – June 2020**
Shape Anomaly Analysis Web App Development [C#, JavaScript, Python, Web, AWS, ML, DL]
 - Designed and built the **Shape Anomaly Analysis Project** website: (1) Users can upload skull CT scans and review anomaly ratings. (2) Researchers can upload and update datasets for physicians to review and label.
 - Individually coded the entire web system of frontend, backend, 3D visualization, database and user management.
 - Architected the ML pipeline and system and host it on a Flask server for handling DL analysis requests.
 - Deployed all servers on AWS, published the website and had 100+ active users by June 2020.
- Senior Software Engineer** **Shanda Games, Shanghai, China** **May 2013 – Apr 2015**
Game Engine and Gameplay Development [C++, Physics Simulation, Mobile, AI, Computer Graphics]
 - Coded component-oriented animation module and optimized collision detection using dynamic space separation.
 - Improved garbage collection to speed up resource loading by 70% and created AI behavior tree visualization tool.
 - Engineered the gameplay, combat, character and guild systems on the mobile clients.
 - Programmed the player interaction module with finite state machines and AI gameplay behavior trees.

Skills

Programming Language: C++, C#, Python, Matlab, JavaScript, TypeScript
Web Dev & Database Sys: .Net Core, Flask, OAuth(Auth0), Angular, Reactjs, MongoDB, SQL Database Sys, Bootstrap
Amazon Web Services: Sagemaker & Studio, S3, Route53, EC2 & RDS, Elastic Beanstalk, Serverless, Docker, Lambda
Others: Pytorch, Scikit-learn, Jupyter Notebook, Google Colab, Unity3D, Unreal4, OpenGL, Box2D, Html, CSS