

Yihui Mao

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INTERESTS

Computer Vision, Data Mining, Graphics, Scientific Visualization and Game Development

EDUCATION

Oregon State University Sep. 2015 - Jun. 2020
B.S. in Computer Science Cumulative GPA : 3.9/4.0 Major GPA: 3.92/4.0
Minor in Actuarial Science Minor GPA: 3.9/4.0
University of Pennsylvania Sep. 2020 - Jun. 2022
MSE in Computer Graphics and Game Technology

SKILLS & TOOLS

Programming Language: C++, Python, C, C#, Java, Intel X86 Assembly Language, Haskell, Prolog
Web Development: HTML, CSS, JavaScript, Node.js, MySQL, MongoDB
Software Development: Unity 3D, Android Studio, Maven, Ninja Framework
Numerical Analysis and Computation: R, GNU Octave, MatLab
Application Programming Interfaces: OpenGL (GLSL), OpenMP, OpenCL
Python Package for Machine Learning and Deep Learning: OpenCV, TensorFlow, Pytorch, Numpy, Keras, Scikit-learn, Matplotlib, Pillow
Machine learning Algorithms: Linear Regression, Logistic Regression, Artificial Neural Network, Decision Trees, SVM, Bayesian networks, Random Forest, Dimensionality Reduction Algorithms, Ensemble learning
Computer Vision: AlexNet, VGG, ResNet, Yolo, SDD

RESEARCH EXPERIENCE

Paper reviewer Aug. 2019
• Reviewed a candidate Transportation Research Board paper applying computer vision to identify road conditions, and gave the comments of revision.

Undergraduate Research Assistant Sept. 2018 - Jun. 2019
Professor: Dr. Haizhong Wang, Civil and Construction Engineering, Oregon State University
• Determined specific research questions by discussion in the group meeting and explored research methods
• Read paper and proposed the concept of the study
• Perfect existing models to implement the concept of the study
• Analyze and interpret the result of the simulation
• Implemented literature review and manuscript preparation
• Reviewed the result of the final version of the manuscript

Participated in the OSU Robotics Research Lab Dec. 2018 - Jan. 2019
Professor: Dr. Cindy Grimm, Mechanical Engineering, Oregon State University
• Participated in the project of robotic grasping project, take charge of image preprocessing
• Fully learnt in all relevant models of Computer Vision
• Proficiency in tools such as OpenCV and TensorFlow

UNDERGRADUATE PROJECTS

An Integrated Social Science and Agent-based Modeling Approach to Improve Life Safety from Near-field Tsunami Hazards, Funded by the National Science Foundation: CMMI-HDBE #1563618, and #1826407. Sept. 2018 - Jun. 2019
Professor: Dr. Haizhong Wang, Civil and Construction Engineering, Oregon State University
Using an alternative tool, Unity 3D, in the multi-modal evacuation simulation for a near-field tsunami and studies how individual behaviors make an impact on the crowd groups in evacuation through the simulation with real physical collision
• Established the road network of Seaside City with OSM file using Unity 3D game engine
• Instantiated the agents and implemented the normal distribution of the agent's coordinates on the road network
• Simulated real evacuation situation with A Star algorithm to determine each person's shortest evacuation route

- Introduced a new type of social force model in the evacuation process to achieve force based individual interaction (physical collision) and equipped agents with the ability of handling dynamic interactive relations
- Observed the mortality rate change generated in the simulation model, and analyzed outcomes of the modified parameters

Automatic Drive and Vehicle Identification Based on Need for Speed Game Scene Winter 2017

- Pre-process OPENCV capture game scenes, use pyautogui to implement game command input
- Road boundary detection with Hough Line Transform
- Carried out dataset training with Alexnet model to accomplish automatic drive of vehicles
- Achieved vehicle identification in driving scenes with Single Shot MultiBox Detector, such as collision warning and automatic collision avoidance

AI Othello May. 2018

Designing the Othello game playing algorithm derived from Alpha Go thinking to achieve the winning result of AI defensive position

- Established a tree data structure to store all the possible following chess moves
- Optimized the algorithm by using Pruning algorithm to remove the excess moves
- Obtained the optimal chess move for each step by means of Minmax algorithm

Sentiment Analysis May. 2018

Building Bayesian Network model based on word sentiment orientation to predict customers' comments on the restaurants

- Used Crawlers to capture users' sentiment preference comments on Yelp
- Extracted corresponding features to generate and optimize Bayesian network
- Collected pre-existing restaurants' customer evaluation as a training set to train and test the classifier
- Obtained the following results— training accuracy 97% and test accuracy 95%

Pseudoknot Detection in RNA Secondary Structures Jun. 2018

- Realized dimensionality reduction with PCA and removed abundant eigenvalue with Random Forest algorithm
- Used K mean, SVM, CNN and RNN model to train the data set and compare the prediction results.
- Discovered the high accuracy of neural network and adopted integrated algorithm for reinforcement

Chat APP, Mobile Software Development Mar. 2018

Based on third-party API information reading, Android Studio is used to develop a chat software based on the Android system

- The software has the functions of setting password, modifying profile, sending and receiving information, notifications, sending and receiving mail, displaying the previous information, setting online offline status, searching for users

RELEVANT COURSES

Computer Networks	Operating Systems	Analysis of Algorithms
Graphics Shaders	Parallel Programming	Computer Graphics
Artificial Intelligence	Andrew Ng Deep Learning in Coursera	Machine Learning & Data Mining
CS231n CNN for Visual Recognition online	Computer Architecture & Assembly Language	CS Skills for Simulation and Game Programming

HONORS & AWARDS

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- Oregon State University Honor Roll for several consecutive terms
 - Computer Science Dean's List for several consecutive terms