Jiyuan SHEN

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EDUCATION

Shanghai University, Shanghai, China 09/2018-06/2022

B.E. in Intelligent Science and Technology GPA: 3.54/4.0

University of Oulu, Finland 07/2019-08/2019

Summer Academic Exchange Program

Honor: Full Scholarship of University of Oulu; Certification of Innovative Creativity and Entrepreneurship Program

PUBLICATION

Jiyuan Shen, *An Efficient Training Strategy for Multi-Agent Reinforcement Learning in Card Games*, published at 2022 2nd International Conference on Artificial Intelligence, Automation and High Performance Computing (AIAHPC)

PROJECT & RESEARCH EXPERIENCES

Deep Reinforcement Learning Project 07/2021-10/2021

Supervisor: Prof. Pietro Lio

- Learned the traditional reinforcement algorithm, familiar with the framework of reinforcement learning, understand the model-free, model-based and Actor-Critic models
- Learn to use open source reinforcement learning frameworks, such as OpenAi, PettingZoo, Rlcard, etc.
- For the card games in multi agents, improved the agents' ability effectively by changing the network structure of the fitted Q function and proposed the gradual promotion training strategy, which included two split stages -- single combat stage and multi combat stage -- and the average reward and winning rate are improved by 25% and 44% respectively
- Paper will be published on IEEE, and after the conference it will be submitted for index in EI

Segmentation Model of Laryngeal Carcinoma and Hypopharyngeal Carcinoma Based on U-Net 04/2021-06/2021

Supervisor: Prof. Xiaodong Yue

- Established an effective segmentation scheme for laryngeal and hypopharyngeal cancer dataset, programmed the automatic extraction of laryngeal cancer and hypopharyngeal cancer tumor areas
- Adopted under-sampling mechanism for uneven positive and negative samples, introduced expert prior knowledge to segment CT images
- Tested different data augment methods, obtained the optimal data augment combination, improve the segmentation ability of the model by using U-Net network and its variation, and combine several modules with the network structure like pyramid pooling module (PPM) and object contextual representation (OCR)

A Solution Method for Time Series Data Regression Prediction 02/2021-03/2021

Supervisor: Prof. Xiaodong Yue

- Solved the problem of lacking a large number of data and unbalance between positive and negative samples, used multiple tradition methods to regress time series data as the baseline
- Proposed a method of transforming time series data into 2-dimension images: Time series data Generate Picture (TGP), which can effectively extract the feature relationship between time series data and generate the combined graph of GASF, GADF and MTF making the result of regression better than the baseline
- Expanded dataset by using voting regression, then generated TGP and fed into ResNet for classification, which effectively improved the accuracy

Gait Recognition - Skynet AI Project | Leader 01/2021-06/2021

Supervisor: Prof. Xing Wu

- Applied semantic segmentation, posture estimation and other advanced methods to build a gait model based on GaitSet, realized the intelligent gait recognition and tracking according to the unique biological information of the human body
- The advantage of the model is to solve the problems of multi-view switching, multi-target (including small targets) parallel recognition, body shape and clothing transformation, and low accuracy of the existing single model.
- Used simulation synthesis technology to solve the current problem of lacking multi-person gait dataset, and then generated a multi-person gait dataset
- Recognized across different viewpoints with an input video length of only 7 frames and an accuracy rate of 82%
- The product is highly portable and easy to deploy: the project is an end-to-end model, easy to apply, and does not require additional camera equipment, such as infrared cameras.

2021 National Digital Ecological Innovation Competition-Intelligent Algorithm Competition 01/2021-03/2021

Supervisor: Prof. Jun Shen

- Focused on the digital ecological industry, used remote sensing image intelligent interpretation technology to achieve ecological asset inventory based on high-resolution remote sensing image data of different topography and landforms
- Employed semantic segmentation related technologies to build a HRNet model

2021 Guangdong Industrial Intelligent Manufacturing Innovation Competition 01/2021-03/2021

Supervisor: Prof. Jun Shen

- Focused on the pain points and difficulties of Foshan manufacturing companies, applied target detection and other technologies to build a Cascade RCNN model to intelligently detect tile surface defects
- Used statistics and sliding window segmentation area size to solve the situation of high image resolution, small detection frame and extremely uneven distribution, and add FPN, DCN, etc. to improve model performance

Improved Yolov5 Target Detection Method Based On Label Smoothing 10/2020-12/2020

First Ocean Target Intelligent Perception International Challenge; Supervisor: Prof. Xing Wu

- Constructed a target detection model for complex marine vessels (including islands and reefs), used YOLOv5 as the baseline because of its detection speed, practicability and generalizability
- Improved YOLOv5 by solving a series of problems such as partial overlap of ships, islands and reefs, labeling noise, abundant targets in a single picture, unbalanced target categories, and changes in light and shadow
- Won the 2nd national prize of the First Ocean Target Intelligent Perception International Challenge Competition (Top 3/200)

The Application of Artificial Intelligence in Daily Life 09/2020-11/2020

Artificial Intelligence Application Competition; Supervisor: Prof. Jun Shen

- In the preliminary contest, analyzed structured data, used traditional machine learning methods to predict diseases
- Analyzed the advantages and disadvantages of different complementation methods, selected the tree regression method to complement a large number of missing values
- Tested different methods of synthesizing new features through experiments, generated strong correlation features
- Chose XGBoost as baseline, supplemented by Five-folds Cross-validation to improve the robustness of the model
- In the final contest, analyzed weather image data, applied deep learning methods to classify images with extremely large noises
- Applied traditional methods (e.g., folding, brightness, saturation changes) as well as random data enhancement to realize data augment
- Selected EfficientNet-b4 as main baseline, tested different optimizers (e.g., Adam, SGD with momentum, and variants of Adam) and loss functions (Cross-entropy Loss Function, Focal Loss Function)
- Manually extracted the color histogram, dark channel features, luminance, contrast and other features of the image, stitched with the features proposed by the convolutional layer to assist the neural network in making judgments with the use of Pseudo-Labeling and Model Ensemble.
- Won the 3rd national prize of Artificial Intelligence Application Competition(Top 9/2100) and was invited to share project experience in Zhuhai

WeChat Applet Application Development | Leader 03/2020-06/2020

Supervisor: Prof. Jun Shen

- Investigated according to actual conditions, constructed project ideas, developed mood-relieving mini programs for practical problems, and combined artificial intelligence to enhance the fun of mini programs
- Won the 1st prize of the 4th National Youth Cup Art Design Competition and the 2nd prize of the East China Division of the WeChat Applet Application Development Competition of the China University Computer Competition

WORK EXPERIENCES

SAIC General Motors Co., Ltd. | IT Intern 06/2021-07/2021

- Complete the translation from SAS to Python, learned target detection algorithm
- Communicated frequently between colleagues to standardize code development
- Developed the function of automatic detection of target parts of the vehicle, assisted the automated production of the assembly line

DeepBlue Technology | Algorithm Intern 01/2021-02/2021

- Deployed corresponding visual algorithms to implement specific business scenarios combining departmental business scenarios
- Participated in the whole set of industrialization engineering construction process, including annotation of data sets, testing of existing algorithms, development of new algorithms, etc.
- Followed up with cutting-edge detection algorithms and regularly communicated with colleagues on literature reading

EXTRACURRICULAR & VOLUNTEER ACTIVITIES

2020 China International Graphene Innovation Conference | Volunteer 09/2020-10/2020

- Guided foreign guests to go through relevant procedures, helped foreign friends quickly register information
- Assisted in maintaining the on-site order of the exhibition hall, responsible for the on-site work of the opening and closing ceremonies, etc.

2020 Summer Student Visit | Member 07/2020-08/2020

- Participated in the concentrated visit activities organized by the District Youth League Committee (including Minhang District historical and cultural venues, economic parks, and creative parks)
- Went to the Greening and City Appearance Administration Bureau to participate in data collation and review, writing, mini program tweet beautification production, etc.
- Wrote a micro-survey on serving the construction of the main urban area of Minhang, and the research report was highly praised by the teachers.
- Awarded by the excellent student certification

Student Union of School of Computer Science, Shanghai University | Member of the External Liaison Department 09/2019-09/2020

- Planed and publicized the annual fixed large-scale event "Just soso Information Retrieval Competition" of the School of Computer Science
- Promoted and hosted the first Artificial Intelligence Match of Shanghai University

Culture and Sports Department, Student Union of Shanghai University Community College | Vise President 02/2019-02/2020

- Organized the Shanghai University guidance training meeting, assisted the college to select outstanding students
- Hosted the first Shanghai University Science and Technology Festival, China-Japan Cultural Exchange Meeting and other large and small activities

SCHOLARSHIP & HONORS

2nd Prize of the First Ocean Target Intelligent Perception International Challenge	12/2020
3rd prize of Artificial Intelligence Application Competition	11/2020
1st Prize of the 4th National Youth Cup Art Design Competition	06/2020
2nd prize of the East China Division of the WeChat Mini Program Application Development Competition	06/2020
Full Scholarship of University of Oulu	08/2019
1st Prize Scholarship of Shanghai University	06/2019
Excellent Military Training Member of Shanghai University	09/2019
2nd Prize Scholarship of Shanghai University Computer Application Competition	09/2018

SKILLS & QUALIFICATIONS

Programming: C/C++, Python, sql, Matlab, js, html&css, Pytorch, mmdet, paddlepaddle

Software: VS Code, PyCharm, WeChat Development Tool, MS Office

Language: Mandarin (native), English (TOEFL 100, GRE 319+3.5)