Chen Gong

INSTITUTE OF AUTOMATION · CHINESE ACADEMY OF SCIENCES · CHINA

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Education

CUGB (China University Of Geosciences, Beijing)
Beijing, China

B.S. IN COMPUTER SCIENCE AND TECHNOLOGY · *Sep. 2016 - Jun. 2020*

- GPA: 3.86
- Rank: 1/68
- Main courses: Higher Mathematics; College Physics; Mathematics Modeling; Microcomputer Principle and Assembly Language; C++ Programming; Discrete Mathematics and Formal Language; Linear Algebra; Programming Practices in Java; Data Structures; Computer Networks; Probability and Statistics; Object-Oriented Software Design; Computer Organization and Architecture; Algorithm Design and Analysis; Computer Graphics; Applications of Database Systems; Computer Network

CASIA (Institute of Automation, Chinese Academy of Sciences)
Beijing, China

M.S. IN PATTERN RECOGNITION AND INTELLIGENT SYSTEM · *Jun. 2020 - Now*

- GPA: 3.90
- Supervisor: Hou Xinwen, Liu Yu
- Main courses: Stochastic Processes; Pattern Recognition; Principle and Algorithms of Artificial Intelligence; Reinforcement Learning; Convex Analysis (unfinished)

Research Experiences

School of Computing and Information Systems, Singapore Management University
Singapore

ADVERSARIAL POLICY LEARNING & REINFORCEMENT LEARNING ALGORITHM TESTING · *Aug. 2021 - Now*

- Supervisor: David Lo
- In adversarial policy, we train an adversarial agent that interacts with a well-trained victim agent in a two-player game environment and triggers the victim agent to react in an undesired fashion. We can use 'the curiosity mechanism', which encourages agents to enter a state that it has never seen before during the training stage, can help to defeat the victim agents.
- Key words: Adversarial policy, Algorithm testing

Institute of Automation, Chinese Academy of Sciences
Beijing, China

OFFLINE REINFORCEMENT LEARNING & SAMPLING METHODS · *Feb. 2021 - Now*

- Based on my interests and previous research experiences, now my study mainly focuses on the sampling and variational problem in offline Reinforcement Learning and dual Reinforcement Learning.
- I hope to build a nice sampling method to improve sampling efficiency and stability in reinforcement learning.
- Key words: Dual; Offline reinforcement learning; Marginalized importance sampling

Institute of Automation, Chinese Academy of Sciences
Beijing, China

REINFORCEMENT LEARNING & VARIATIONAL INFERENCE · *Nov. 2019 - Dec .2020*

- Research on the theory of reinforcement learning: Through the constraint of the Bellman residual distribution, I proposed a general method of stabilizing the reinforcement learning training process, and conducted the experimental exploration.
- During the research period, two papers were accepted as oral in ICONIP 2020 and ICME 2021 respectively. A paper was submitted to the journal *Neurocompting*.
- I completed the undergraduate graduation design which was awarded the "Excellent Graduation Thesis".
- Key words: Bellman residual distribution; Stationary random process; Stein variational gradient descent; Quantile regression; Kullback-Leibler divergence; Wasserstein distance

Tsinghua University, School of Medicine
Beijing, China

MEDICAL IMAGE PROCESSING · *Jue. 2019 - Aug. 2019*

- Using the Mask R-CNN algorithm based on deep learning, combined with CTA images, we completed the segmentation of the coronary arteries of the heart. Based on Mask R-CNN, the image pre-processing and post-processing steps were added to further improve the segmentation accuracy.
- Key words: Mask R-CNN, Image segmentation; Coronary arteries

China University of Geosciences, Beijing
Beijing, China

MACHINE LEARNING IN MEDICINE · *Dec. 2017 - Feb. 2019*

- After exploring related methods, a model that combines machine learning and feature extraction methods to classify intracranial EEG signals for automatic diagnosis of epilepsy diseases was proposed.
- I completed three papers as the first author. One paper was accepted by the journal *Computational Biology and Chemistry*. One paper was accepted by *Chinese Journal of Electronics*. One paper was accepted by the journal *Applied Intelligence*.
- Key Words: Intracranial Electroencephalogram (iEEG), Epilepsy; Discrete wavelet transform, Parallel computing, Local simulated annealing, Probabilistic neural network

Publications

Chen Gong, Xiaoxiong Zhang, Yunun Niu. Identification of epilepsy from intracranial EEG signals by using different neural network models[J]. Computational Biology and Chemistry, 2020, 87: 107310. **Published**. (IF=2.88) [Paper]

Chen Gong, Jiahui Liu, Yunyun Niu. Intracranial Epileptic Seizures Detection Based on an Optimized Neural Network Classifier[J]. Chinese Journal of Electronics, 2021, 30(3): 419-425. **Published**. (IF=1.01) [Paper]

Chen Gong, Xinchen Zhou, Yunyun Niu. Pattern recognition of epilepsy using parallel probabilistic neural network[J]. Applied Intelligence, 2021: 1-12. **Published**. (IF=5.09) [Paper]

Chen Gong, Yunpeng Bai, Xinwen Hou, Xiaohui Ji. Stable Training of Bellman Error in Reinforcement Learning [C]. International Conference on Neural Information Processing. Springer, Cham, 2020:439-448. **Published**. (oral) [Paper]

Chen Gong*, Qiang He*, Yunpeng Bai, Xinwen Hou, Guoliang Fan, Yu Liu. Wide-Sense Stationary Policy Optimization with Bellman Residual on Video Games[C]. 2021 IEEE International Conference on Multimedia and Expo (ICME). IEEE, 2021: 1-6. **Published**. (oral) [Paper]

Chen Gong, Yunpeng Bai, Qiang He, Xinwen Hou, Xiaohui Ji. Optimization of Bellman Error Distribution based on Stein Variational Gradient Descend in Reinforcement Learning. **Submitted** to Neurocompting. (IF=5.72)

Awards & Honors

AWARDS

2020	**Finalist**, the COMAP's Mathematical Contest in Modeling	*Beijing, China*
2019	**Meritorious Winner**, the COMAP's Mathematical Contest in Modeling	*Beijing, China*
2018	**Honorable Mention**, the COMAP's Mathematical Contest in Modeling	*Beijing, China*
2018	**First prize in Beijing**, Contemporary Undergraduate Mathematical Contest in Modeling	*Beijing, China*
2017	**First prize**, Mathematics Competition of China University of Geosciences	*Beijing, China*

HONORS

2021	**Merit Student**, University of Chinese Academy of Sciences	*Beijing, China*
2020	**Beijing Outstanding Graduates**, Beijing Municipal Education Commission	*Beijing, China*
2020	**School-level Excellent Graduation Thesis**, China University Of Geosciences , Beijing	*Beijing, China*
2017	**Outstanding Member**, China University Of Geosciences , Beijing	*Beijing, China*
2017	**National Scholarship for Undergraduates**, Ministry of Education of the people's Republic of China	*Beijing, China*

Presentation

The 27th International Conference on Neural Information Processing (ICONIP 2020) *Online*

PRESENTER FOR THE PAPER "STABLE TRAINING OF BELLMAN ERROR IN REINFORCEMENT LEARNING" *Nov. 2020*

- Introduce the design of our algorithm framework; the origin of our idea; the reason why our algorithm can obtain the nice performance; the specific process of algorithm realization; the design of experiments.
- The video is presented in YouTube. [Video]

Skills, Certifications & Others

Languages: Chinese (Native) & English (CET6)

Skills: Python | C++ | Matlab | Linux | LaTex

Interests: Swimming | Basketball | Football | Music

Activities: Sharing my research notes in Zhihu website. Welcome to visit my Zhihu homepage: [Chen Gong's homepage].

Summary

I have a good theoretical background in machine learning, especially in reinforcement learning. Besides, the B.S. in Computer Science and Technology offers me a good command of basic computer knowledge and relevant skills, such as Python, C++, Linux, Git, etc. Thus, I think I can integrate my theoretical knowledge into actual projects well.

I have a strong self-learning ability. I am learning *Functional Analysis*, *Machine Learning*, and *Statistical Reinforcement Learning (CS 598)* by online course. Besides, I have been shared my course notes in Zhihu website for more than one year ([Chen Gong's homepage]). I dare to challenge and enjoy exploring interesting problems. While facing a hardship, I tend to discuss with my schoolmates after thinking independently.