

QUALIFICATIONS

- Publish several papers at **NeurIPS**, **AAAI**, and the top-tier journal by **Nature Publishing Group**.
- Ongoing work includes **Large Language Model(LLM)-based recommendation system**, and **depression/anxiety diagnostic model based on the BERT technique**.
- Strong knowledge of theory, practice, and research experience on **reinforcement learning** (focusing on deep stochastic contexture bandit problem and Monte Carlo tree search) and **deep neural networks-based recommendation system** with an emphasis on self-attention module and click-through rate prediction.
- Proficient in Python and C++, with advanced expertise in machine learning frameworks including PyTorch and Scikit-learn, complemented by strong capabilities in data manipulation using Numpy, Pandas and Boost C++.

EDUCATION

- 2018–Present **Ph.D – Machine Learning**, *School of Computing*, Univeristy of Connecticut, Storrs, Connecticut, GPA 4.0/4.0.
- 2014–2017 **M.A. – Computer Science and Technology**, Northeastern University, Shenyang, China.
Thesis: Research and Application of Algorithm on Knowledge Learning from Expert Game Records of Go
- 2010–2014 **B.S. – Computer Science and Technology**, Northeastern University, Shenyang, China.
Thesis: Design and Implementation of Script-Based Information System

RESEARCH EXPERIENCE

- 2019–Present **Research Assistant: Interpretable Deep Neural Network for Recommender Systems**, *University of Connecticut, Storrs, Connecticut*.
- **Ongoing work**: Develop, fine-tune, and evaluate a click-through rate (CTR) prediction system that combines the embedding layer from our cutting-edge CTR model with the large language model LLaMa 2.
 - Developed a deep neural network based on the **BERT architecture** to diagnose depression and anxiety disorder with MRI images. The corresponding research paper is nearing completion.
 - Designed and implemented Polyhedron Attention Module, an **interpretable self-attention model** for deep neural networks. Conducted experiments to show the proposed module's state-of-the-art performance on the **Click-through Rate Prediction** problem, a critical task in the recommender system. This work was accepted by **NeurIPS 2023**.
 - Developed deep neural networks diagnosing alcohol/nicotine use disorder with MRI images, which leveraged interpretable knowledge of brain networks and alcohol/nicotine biotypes to enhance performance. Two papers of this work were published in **Translational Psychiatry 2022 (by Nature Publishing Group, Q1 journal)** and **Biological Psychiatry: Cognitive Neuroscience and Neuroimaging 2023 (Q1 journal)**.
- 2018–2022 **Research Assistant: Optimization and Convergence Analysis in Deep Reinforcement Learning**, *University of Connecticut, Storrs, CT*.
- Proposed a stage-wised optimization algorithm for *deep stochastic contextual bandits problem*. Performed theoretical analysis and extensive experiments to demonstrate the effectiveness and efficiency of the proposed algorithm. This work was accepted by **AAAI 2021 (Acceptance rate: 21.1%)**.
- 2014 – 2017 **Research Assistant: Key Algorithm Research in High Complex Game Problem Based on Deep Learning**, *Northeastern University, Shenyang, China*.
- Proposed Belief-state Monte-Carlo Tree Search, a searching framework used in imperfect information games, which was published in **IEEE Symposium on Computational Intelligence and Games 2015** and **IEEE Transactions on Games 2017**.

SELECTED PAPERS (7/19)

- 2023 [1] **Tan Zhu**, et al. "Polyhedron Attention Module: Learning Adaptive-order Interactions." NeurIPS 2023, (**A⁺ conference**).
- 2023 [2] **Tan Zhu**, et al. "Machine Learning of Functional Connectivity to Biotype Alcohol and Nicotine Use Disorders." Biological Psychiatry: Cognitive Neuroscience and Neuroimaging, 2023, (**Q1 journal, impact factor: 5.9**).
- 2023 [3] Fei Dou, Jin Lu, **Tan Zhu**, et al. "On-Device Indoor Positioning: A Federated Reinforcement Learning Approach With Heterogeneous Devices." IEEE Internet of Things Journal, 2023, (**Q1 journal, impact factor: 9.9**).
- 2022 [4] **Tan Zhu**, et al. "Identifying alcohol misuse biotypes from neural connectivity markers and concurrent genetic associations." Translational Psychiatry 12, no. 1 (2022): 253, (**Q1 journal, by Nature Publication Group, impact factor: 7.9**).
- 2021 [5] **Tan Zhu**, et al. "An Efficient Algorithm for Deep Stochastic Contextual Bandits." In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 35, no. 12, pp. 11193-11201. 2021, (**A⁺ conference**).
- 2019 [6] Chunjiang Zhu, **Tan Zhu**, et al. "Communication-optimal distributed dynamic graph clustering." In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 33, no. 01, pp. 5957-5964. 2019, (**A⁺ conference**).
- Working paper **Tan Zhu**, Fei Dou, Chloe Becquey, Jinbo Bi, "Identifying Interactions among Categorical Predictors with Monte-Carlo Tree Search."