

BOHUA WAN

<https://github.com/GlenGGG> ◊ <https://bohua-wan.netlify.app>

EDUCATION

Johns Hopkins University *January 2021 - Present*
Whiting School of Engineering

- Ph.D. in Computer Science, expected June 2027
- M.S.E. in Computer Science, conferred June 2022 GPA: 4.0

China University of Petroleum, Beijing *September 2016 - June 2020*
College of Information Science and Engineering

- B.S. in Computer Science and Technology Rank: 1/103 GPA: 91.9/100.0

RESEARCH EXPERIENCE

Spatial-temporal attention for video-based assessment of intraoperative surgical skills. *Oct 2021 - Present*
Research Assistant—supervised by Professor Gregory D. Hager *Johns Hopkins University*

- Proposed a model that supervises the spatial attention map with instrument tip locations. Experiments show improved performance and generalizability in internal and external validations.
- Proposed a two-stage method that generates temporal attention for the whole video instead of short clips.
- Evaluated several semi-supervised domain adaptation techniques for improving models' performance in external validations.

Framework to unify statistical and machine learning concepts on the generalizability of CPMs *July 2021 - Present*
Research Assistant—supervised by Professor Swaroop Vedula *Johns Hopkins University*

- Matched statistical concepts to dataset shifts in machine learning literature. For example, measurement bias maps to domain shift, and sampling bias maps to sample selection shift.
- Use causal inference and selection diagrams to analyze the transportability of relations under dataset shifts.
- Proposed a hypothesis that describes a condition under which no dataset shift may exist. By breaking this hypothesis, we have the root causes of all dataset shifts.
- Designed a checklist for medical researchers to assess the risk of dataset shifts between the development dataset and the application data.

Unsupervised Domain Adaptation for Image Classification *April 2021 - May 2021*
Research team lead *course project at Johns Hopkins University*

- Investigated Adversarial Discriminative Domain Adaptation (ADDA) and Deep CORAL methods with 3 other group members.
- Proposed a new network by using Deep CORAL to constrain ADDA from drastic deviating from the pretrained initialization, which is proven to be both effective and efficient in terms of performance and training time.

Skeleton-based human interaction recognition with graph convolutional network *September 2019 - January 2021*
Research Assistant—supervised by Professor Liping Zhu *China University of Petroleum, Beijing*

- Designed a Relational Adjacency Matrix to represent relational graphs between separate skeletons using geometric features and relative attention.
- Proposed Dyadic Relational Graph Convolutional Network, which achieves state-of-the-art accuracy on three challenging datasets with improvements of 6.63% on NTU-RGB+D and 5.47% on NTU-RGB+D 120 over the baseline model.
- Our methods consistently help advanced models achieve higher accuracy of 1.26% on NTU-RGB+D and 2.86% on NTU-RGB+D 120.

PUBLICATIONS

- [1] Zhu, L., Wan, B. (Co-First), Li, C., Tian, G., Hou, Y., & Yuan, K. (2021). Dyadic relational graph convolutional networks for skeleton-based human interaction recognition. *Pattern Recognition*, 115, 107920.
- [2] Wan, B., Caffo B. & Vedula S. S. (2022) A Unified Framework on Generalizability of Clinical Prediction Models. *Front. Artif. Intell.* 5:872720. doi: 10.3389/frai.2022.872720

SKILLS

Programming Languages	Python (proficient), C/C++ (proficient), Java (proficient), JavaScript (familiar)
Platforms & Frameworks	PyTorch (proficient), Django (proficient), Qt (proficient), Spark Java (proficient) CUDA (familiar), TensorFlow (familiar)
Deep Learning Techniques	CNN (proficient), GCN (proficient), GNN (familiar), GAN (familiar), DQN (familiar)

HONORS & AWARDS

CNPC Scholarship (exclusively rewarded to the top 5%, one of the highest honors in our university.)

Fall, 2018

Sinopec Scholarship (exclusively rewarded to the top 5%, one of the highest honors in our university.)

Fall, 2017