

YANGLAN OU

PhD, Penn State University

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PROFESSIONAL EXPERIENCE

Bosch Center for AI, Sunnyvale

Research Intern

June, 2021 - Dec, 2021

Advisor: Dr. Bharath Krishnan Navalpakkam

- Designed machine learning algorithms for active learning and semi-supervised segmentation, optimizing the process of selecting and labeling data.
- Improved performance by enhancing intelligent data selection methods, leading to more effective segmentation results.

RESEARCH EXPERIENCE

Multi-Modal Image Segmentation with Diffusion Models

Keywords: Multi-Modal; Diffusion Models; LoRA; Pytorch

- Proposed a versatile framework requiring only fine-tuning to handle various input modalities effectively.
- Leveraged pre-trained diffusion models to extract informative features, significantly boosting model performance.

Medical Image Segmentation with Transformers

Keywords: Image Segmentation; Vision Transformer; Pytorch

- Proposed an encoder-decoder Vision Transformer (ViT), Patcher, designed for accurate image segmentation.
- Overcame the limitation of traditional ViTs by designing efficient multi-level feature extraction.
- Our model outperforms the SOTA by more than 12%.

Multi-Agent Forecasting with Transformers

Keywords: Trajectory Prediction; Spatial-Temporal; Transformer; Pytorch

- Proposed AgentFormer that leverages a sequence representation of multi-agent trajectories and incorporates an agent-aware attention mechanism to preserve agent identities.
- Simultaneously models both the time and social dimensions, effectively addressing complex agent interactions and behavioral uncertainty.
- Our model outperforms SOTA multi-agent trajectory forecasting methods by 20% for final displacement error (FDE).

Segmentation for 2.5D Data

Keywords: Image Segmentation; Attention; Anisotropic Data; Pytorch

- Proposed LambdaUNet, a tailored neural network architecture for segmenting highly-discontinuous 2.5D data in diffusion-weighted (DW) magnetic resonance imaging (MRI) scans.
- Captured dense intra-slice and sparse inter-slice context by introducing Lambda+ layers, enabling the generation of informative 2.5D features.
- Our model outperforms the SOTA by 8.31% for Dice Score.

Semi-supervised Image Classification with Graph Convolutional Network

Keywords: Graph Convolution Network (GCN); Semi-Supervised; Image Classification; Pytorch

- Proposed a novel graph convolutional network (GCN) based semi-supervised classification model for automated cervical dysplasia detection.
- Introduced a flexible GCN model with an adaptive and learnable adjacency matrix update during learning.

Sentiment Classification with Attention

Keywords: NLP; Classification; Attention; Tensorflow

- Introduced the attention-over-attention (AOA) neural network for aspect-level sentiment classification.

- Jointly modeled the interaction between aspects and sentences and automatically highlighted important parts of the sentences.

EDUCATION

Pennsylvania State University Ph.D. in Computer Vision & Machine Learning	Aug. 2018 - May 2023 Advisor: Prof. Sharon Huang
Carnegie Mellon University M.S. in Electrical and Computer Engineering	Jan. 2017 - May. 2018 Advisor: Dr. Christoph Mertz
Donghua University, China B.E. in Electrical Engineering & Automation	Sep. 2012 - Jun. 2016 Advisor: Prof. Wuneng Zhou

PUBLICATIONS

- Yanglan Ou**, Xiaolei Huang, Kelvin K. Wong, Jonathon Cummock, John Volpi, James Z. Wang and Stephen T.C. Wong, "BBox-Guided Segmentor: Efficient and Accurate Stroke Lesion Segmentation with Weakly Supervised Bounding Box Prior." Computerized Medical Imaging and Graphics (CMIG) 2023.
- Yanglan Ou**, Ye Yuan, Xiaolei Huang, Stephen T.C. Wong, John Volpi, James Z. Wang and Kelvin K. Wong. "Patcher: Patch Transformers with Mixture of Experts for Precise Medical Image Segmentation." Proc. of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2022.
- Vincent Pisztor, **Yanglan Ou**, Xiaolei Huang, Francesca Chiaromonte, Jia Li. "Epsilon Consistent Mixup: Structural regularization with an adaptive consistency-interpolation trade-off." Stat 11, no. 1 (2022): e425.
- Ye Yuan, Xinshuo Weng, **Yanglan Ou**, Kris Kitani. "AgentFormer: Agent-Aware Transformers for Socio-Temporal Multi-Agent Forecasting." Proc. of International Conference on Computer Vision (ICCV), 2021.
- Yanglan Ou**, Ye Yuan, Xiaolei Huang, Kelvin Wong, John Volpi, James Wang, Stephen Wong. "LambdaUNet: 2.5D Stroke Lesion Segmentation of Diffusion-weighted MR Images." Proc. of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2021.
- Vincent Pisztor, **Yanglan Ou**, Xiaolei Huang, Francesca Chiaromonte, Jia Li. "Epsilon Consistent Mixup: An Adaptive Consistency-Interpolation Tradeoff." CoRR, 2021.
- Yanglan Ou**, Yuan Xue, Ye Yuan, Tao Xu, Vincent Pisztor, Jia Li, Xiaolei Huang. "Semi-supervised cervical dysplasia classification with learnable graph convolutional network." In Proc. of IEEE International Symposium on Biomedical Imaging (ISBI), pp. 1720-1724, 2020. (Oral Presentation)
- Binxuan Huang, **Yanglan Ou**, and Kathleen M. Carley. "Aspect level sentiment classification with attention-over-attention neural networks." In Proc. of International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation, pp. 197-206. Springer, Cham, 2018.
- Quanquan Zhou, Wuneng Zhou, **Yanglan Ou**, Anding Dai, and Jiaoling Chen. "Projective synchronization control of unknown chaotic neural networks with delay and noise perturbation." In Proc. of International Conference on Natural Computation (ICNC), pp. 67-71, 2014.

AWARDS

MICCAI Student Travel Award	2021
Excellent Graduate Award of Donghua University	2016
Excellent Student Scholarship	2013, 2014, 2015

PROFESSIONAL SKILLS

Programming Languages: Python, MATLAB, Java, C++
Tools: PyTorch, Tensorflow, Keras, OpenCV, Git, LaTeX, CUDA