Ziao Yang

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EDUCATION

Brandeis University 2023.08 - 2028.05
Doctor of Philosophy-Ph.D., Computer Science Doctor Waltham, MA, USA
Advised by Prof. Hongfu Liu

Sun Yat-Sen University 2018.09 - 2022.07
Bachelor of Engineering, Computer Science Guangzhou, China

RESEARCH AND INDUSTRY EXPERIENCE

Brandeis University
Ph.D Student, Advisor: Prof. Hongfu Liu

- Conduct research on Data Valuation.
- Use shapley value to measure the value of each point in the training set in classification tasks.
- Plan to propose a paper and submit it to ICML 2024.

Y Combinator China 2023.03 - 2023.07
Investment Assistant, Leader: Dr. Qi Lu Beijing, China

- Crafted strategic presentations and financing materials for Dr. Qi Lu, e.g. "My Foundation Model Worldview."
- Led industry research and liaised with leading scientists from Microsoft Research, Meta Research, Nvidia Research, IDEA Research, and Shanghai AI Lab.

International Digital Economy Academy 2022.03 - 2022.07
Research Intern, Mentor: Dr. Jiaxing Zhang Shenzhen, China

- Constructed Supervised pre-training datasets (27million) for multi-classification tasks using existing datasets and performed sub-task sampling.
- Performed supervised pre-training on BERT using Meta-Learning algorithms (e,g., MAML, Reptile) to enlighten it with prior classification knowledge.
- Used variational information bottleneck and sharpness-aware minimization to ease the model's memorization of the training task labels and improve the generalization of the model.
- Built and trained large-scale spatiotemporal foundation models based on patch option in the field of weather nowcasting using 16 A100 GPUs.

Sun Yat-Sen University & China Meteorological Administrstion 2020.09 - 2022.03
Research Assistant, Mentor: Prof. Qing Ling, Dr. Qifeng Lin Guangzhou, China

- Wrote a paper "PTCT: Patches with 3D-Temporal Convolutional Transformer Network for Precipitation Nowcasting."
  - Introduced a patch option to TCTN, where original radar echo frames are split into multiple patches to remove the constraint of inductive bias of CNN (i.e., translation invariance and locality).
  - Mask random patches of original frames and reconstruct them in the loss function which is helpful to avoid overfitting.
  - Set up a real-time radar echo extrapolation system in National Super Computer Center in Guangzhou. This system is used to assist the National Meteorological Administration in Precipitation Nowcasting.
- Wrote a paper "TCTN: A 3D-Temporal Convolutional Transformer Network for Spatiotemporal Predictive Learning."
  - Proposed a Transformer-based encoder with 3D temporal convolutional layers employed to capture better short-term and long-term dependencies than plain Transformer.
  - Used a Sequence Mask in attention score to prevent leftward information flow to preserve the auto-regressive property.
  - The official implementation of TCTN got 80+ star in github.

- This work was recommended by the national level of the “College student innovation competition of Sun Yat-Sen University” (Top 1).

SELECTED AWARDS

- 2022 Tianchi Big Data Competition - AI Helps Strong Convection Weather Forecast (**Top 1%**).
- National level of the College student innovation competition of Sun Yat-Sen University (**Top 1**).

PAPERS

- **Ziao Yang**, Xiangrui Yang, Qifeng Lin. "PTCT: Patches with 3D-Temporal Convolutional Transformer Network for Precipitation Nowcasting," this paper was submitted to IEEE/CVF Winter Conference on Applications of Computer Vision. **WACV 2023**. Before that, it was submitted to Thirty-sixth Conference on Neural Information Processing Systems NeurIPS 2022, but the reviewers gave the following ratings: 5, 4, 3, 3, 3. Then we withdraw it. [pdf]
- **Ziao Yang**, Xiangrui Yang, Qifeng Lin. "TCTN: A 3D-Temporal Convolutional Transformer Network for Spatiotemporal Predictive Learning," arXiv preprint arXiv:2112.01085, 2021. [pdf] [code]

SKILLS

- **Deep Learning Software:** Pytorch, PyTorch Lightning
- **Programing Language:** Python, Matlab, C/C++, LATEX

OTHERS

Sports

- Captain of the volleyball team of the School of Computer Science and Engineering, Sun Yat-Sen University.
- National first-class athletes in swimming.