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Hengyue Liang

SUMMARY

- 5th-year Ph.D student (candidate) in the Department of Electrical and Computer Engineering, University of Minnesota.
- Research interests: machine learning, deep learning, computer vision and robustness, AI in medical imaging and healthcare.
- Proficient in programming with Python, Matlab; have experience in C++, C, SQL.
- Proficient in machine learning tools such as `PyTorch`, `Scipy`, `sklearn`, etc.

EDUCATION

Ph.D, Electrical and Computer Engineering **Sep 2018 - Present**
University of Minnesota, Twin Cities, Minneapolis, MN

Master of Science, Electrical Engineering **Graduated: June 2017**
Chalmers University of Technology, Göteborg, Sweden

Bachelor of Engineering, Electrical Engineering **Graduated: June 2015**
Shanghai Jiao Tong University, Shanghai, China

RESEARCH EXPERIENCE

Graduate Research Assistant **Dec 2020 - Present**
Advisor: Ju Sun *Department of Computer Science and Engineering*

- General machine learning researches:
  - Study (adversarial and natural) robustness problems of computer vision models.
  - Help develop constraint optimization solvers for deep learning models, e.g., provide new tools to solve adversarial robustness formulation beyond l_1, l_2 and l_∞ norm.
- Research related to medical AI:
  - Rib fracture detection and segmentation.
  - NIH Long COVID Computational Challenge (L3C).
  - Video-based automatic motor-tic events (Tourette Syndrome) detection for diagnostic assistant. Prelim study has achieved $\sim 88\%$ accuracy in eye-tic events detection.
  - Automatic symbol and context abstraction of clinical hearing report. Prelim study has achieved $\sim 80\%$ marker-reading accuracy of the hearing loss audiogram in format D.

Graduate Research Assistant **Sep 2018 - Dec 2020**
Advisor: Changhyun Choi *Department of Electrical and Computer Engineering*

- Robotics researches:
  - Study robotic (visual) perception and manipulation problems via data-driven / deep learning methods.
  - Explore effective reinforcement learning algorithms for robot to achieve sample efficiency and free from collision risks.

WORK EXPERIENCE

Applied Scientist Intern **June 2021 - Sep 2021**

Mentor: Vivek Yadav *Multi-sensory Team, Amazon*

- Explore algorithms to generate realistic head motions for virtual animated avatar based on audio speech inputs (AR/VR application).

Publications

[1] **Hengyue Liang**, Buyun Liang, Ju Sun. "Optimizers Matter in Adversarial Robustness." In preparation for "IEEE Transactions on Pattern Analysis and Machine Intelligence" (PAMI).

[2] **Hengyue Liang**, Buyun Liang, Ju Sun. "Optimization for Robustness Evaluation beyond ℓ_p Metrics" Submitted to "2023 IEEE International Conference on Acoustics, Speech, and Signal Processing" (ICASSP).

[3] Le Peng, **Hengyue Liang**, Gaoxiang Luo, Taihui Li, Ju Sun. "Rethink Transfer Learning in Medical Image Classification." In preparation for "IEEE Transactions on Medical Imaging" (TMI). Project Page: `https://sun-umn.github.io/Transfer-Learning-in-Medical-Imaging/`

[4] Hengkang Wang, Taihui Li, Zhong Zhuang, Tiancong Chen, **Hengyue Liang**, Ju Sun. "Early stopping for deep image prior." In preparation for "IEEE Transactions on Pattern Analysis and Machine Intelligence" (PAMI). Preprint: `https://arxiv.org/pdf/2112.06074.pdf/`

[5] Taihui Li, **Hengyue Liang**, Ju Sun. "Self-Validation: Early Stopping for Single-Instance Deep Generative Priors." Accepted to British Machine Vision Conference (BMVC) 2022. Project page: `https://sun-umn.github.io/Self-Validation/`

[6] **Hengyue Liang**, Xibai Lou, Yang Yang, and Changhyun Choi. "Learning Visual Affordances with Target-Orientated Deep Q-Network to Grasp Objects by Harnessing Environmental Fixtures." IEEE International Conference on Robotics and Automation (Accepted to ICRA 2021). Project Page: `https://sites.google.com/umn.edu/ki-dqn/`

[7] Yang, Yang and Yuanhao, Liu and **Hengyue, Liang** and Xibai, Lou and Changhyun Choi. "Attribute-Based Robotic Grasping with One-Grasp Adaptation." IEEE International Conference on Robotics and Automation (Accepted to ICRA 2021). Project Page: `https://sites.google.com/umn.edu/attributes-grasping`

[8] Yang, Yang, **Hengyue Liang**, and Changhyun Choi. "A deep learning approach to grasping the invisible." IEEE Robotics and Automation Letters 5.2 (RA-L 2020): 2232-2239. Project Page: `https://sites.google.com/umn.edu/grasping-invisible`

AWARDS

- Excellent Master Thesis Award, Department of Electrical Engineering *Chalmers, 2017*
  (Thesis link)
- Chalmers 'Advancez' Scholarship for international students *Aug. 2015 — June. 2017*