Phuc’s LOR Draft | Dr/Prof. X

1. Overview

Full Name: Phuc Nguyen Duc Anh
Role of Phuc:

First name:
Last name:
Organization:
Duration of Working Together:
Position/Title:
Relationship:
Phone Number:
Email Address:

Background of Collaboration:

2. Research Capabilities

Project 1: *Open-Vocabulary 3D Instance Segmentation*

Project Description: This project focused on developing algorithms to solve the problem of Open-Vocabulary 3D Instance Segmentation (OV-3DIS). The motivation was to propose a model capable of recognizing small, rare, and uncommon objects, which serves as a foundation for solving real-world automation problems and paves the way for future research.

Phuc's Contribution:

- **Role & Responsibilities:** Phuc was the lead researcher on this project, proposing the algorithm, implementing it, comparing and evaluating it with other methods across multiple datasets, and writing the paper.
- **Achievements:** The project resulted in one paper accepted at CVPR 2024, runner-up at ICCV 2023 workshop, and winner at CVPR 2024 workshop.

Project 2: *Open-Ended 3D Instance Segmentation*

Project Description: This project introduced the new problem Open-Ended 3D Instance Segmentation and the evaluation metrics, while also developing a method to solve it based on previous approaches. The motivation was to help computers interact with the real world without language constraints by leveraging Multimodal-LLM 3D tokens aggregation. The goal was to propose a scalable approach and utilize Open3DIS as a baseline method; this work paves the way for future studies.

Phuc's Contribution:

- **Role & Responsibilities:** Phuc served as the main researcher, proposing and implementing the algorithm, as well as conducting comparisons and evaluations across different datasets, paper writing.
- **Achievements:** One paper under-reviewed at a top-tier conference.

Project 3: *Class-Agnostic 3D Instance Segmentation*

Project Description: This project aimed to develop algorithms for solving Class-Agnostic 3D Instance Segmentation. Current methods require exhaustively segmenting every 2D video frame and unsupervised merging, which is both time-consuming and inaccurate. The proposed method used SAM2, resulting in 30% better segmentation accuracy compared to Open3DIS and a speed 10x faster than previous methods, providing a reliable mask segmenter for future work.

Phuc's Contribution:

- **Role & Responsibilities:** Phuc was the lead researcher, proposing and implementing the algorithm, evaluating it against other methods, and finalizing the paper.
- **Achievements:** One paper under-reviewed at a top-tier conference.

Research Skills

Research Methodology: Phuc demonstrates strong independent research skills, particularly in staying up-to-date with the latest literature, conducting thorough literature reviews, and effectively presenting key findings to the team and Dr/Prof. X. From this, Phuc draws conclusions and identifies areas of improvement for his own work, incorporating these improvements in a meaningful way.

Creativity & Critical Thinking: Phuc consistently brings unique and significant ideas to ongoing research, such as using superpoints as 3D priors for merging 2D masks in Open3DIS, and adopting an optimization-based strategy to aggregate 2D masks from multiple views in Any3DIS. He is quick and precise in implementing proposed ideas, and when faced with issues, Phuc is highly adaptable in identifying errors, finding shortcomings, and improving upon the idea.

3. Technical Skills

Phuc has a solid foundation in 3D geometry, machine learning, and computer vision, as demonstrated by his work at ABC Research. Additionally, he has experience participating in AI challenges, achieving high ranks in two workshops at ICCV and CVPR. Phuc has extensive experience in reading, writing, and evaluating research papers, which is evident from his reviews and authored publications. In coding, Phuc is exceptionally confident, having scored among the highest in coding interviews during his interview for the AI Residency Program.

4. Adaptability and Growth:

Motivation to 3D scene understanding: At ABC Research, Phuc was given the freedom to choose his research direction. He selected Open-Vocabulary 3D Scene Understanding because he recognized that for machines to interact optimally with humans and objects, they must comprehend the fundamental knowledge of surrounding entities, much like humans do. Building a model capable of recognizing everything around it using natural language is a crucial step toward this goal.

Quick Learning Ability: When Phuc first joined ABC, he had to familiarize himself with 3D scene understanding, a completely new area for him since his prior focus was on 2D perception. Open-vocabulary 3D understanding was particularly challenging, as it had only been explored in the past two years. Despite this, Phuc showed considerable effort, and after only four months, achieved runner-up in his first challenge (at a time when no papers had yet addressed OV-3DIS).

Commitment to Growth: Phuc joined ABC during his third year of university, balancing both studying and working. Despite this, he successfully completed his duties, with his first CVPR paper being accepted. Phuc was also the youngest resident in his batch but showed a continuous eagerness to learn and improve.

5. Suggestions for Dr/Prof. X

Key Points to Highlight:

- Phuc is a young, highly motivated AI resident who possesses a creative mindset and a passion for research. He is always eager to explore and develop effective solutions to challenging problems.
- Phuc has demonstrated the potential to become an independent AI researcher, as evidenced by his contributions at ABC.
- Phuc has a strong academic and research background and constantly challenges his own ideas to improve. He also possesses an effective research methodology that allows him to stay thoroughly updated on prior research while identifying gaps and proposing new problems, metrics, methods and detailed evaluation approaches.

6. Supplementary Materials:

[1] Statement of Purpose (SOP)

[2] Curriculum Vitae (CV)

[3] PhD Application Information Table for SOPs