Vuong (Dustin) Nguyen

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Summary

Ph.D. candidate in Computer Science with 4-year research and industry experience in Computer Vision and Machine Learning. A strong team leader and a collaborative team player. Well-equipped with critical thinking and skills in ML/DL.

Education

University of Houston — Houston, TX
Ph.D. in Computer Science — *Aug 2022 – Present*

Hanoi University of Science and Technology — Hanoi, Vietnam
B.S. in Applied Mathematics and Informatics | Talent Honors Program — *Sep 2017 – Jul 2021*

Skills

Programming: Python, C++, R, MATLAB, MySQL, PHP, HTML

Frameworks: PyTorch, TensorFlow, Caffe, OpenCV, PyTorch3D, SciPy, Scikit-Learn, NumPy, Pandas, Matplotlib

Tools: MLFlow, Kubeflow, Git, Linux, Docker, AWS, CUDA, Blender, API, ONNX, Clusters

Experience

University of Houston — Houston, TX
Graduate Research Assistant — *Aug 2022 – Present*

- Organization: Quantitative Imaging Lab; Advisor: Prof. Shishir Shah, Department of Computer Science.
- Research topics: Person Re-Identification, 3D Reconstruction, Face Recognition and Data Quality Assessment.

Grooo International JSC — Hanoi, Vietnam
AI Engineer — *Feb 2021 – Jul 2022*

- Preprocessed and analyzed large-scale datasets; Developed efficient and scalable ML models and pipelines.
- Collaborated with product management and development team to develop product features and deploy models.

Projects

Cloth-Changing Person Re-Identification (CCRe-ID) | *GitHub* — *Aug 2022 - Present*

- Lead a review paper on CCRe-ID; Develop the open-source baseline code repository for Video-based CCRe-ID.
- Build a large-scale synthetic Video-based CCRe-ID dataset for a CVPR paper using GAN and OpenCV; Generate body segmentation masks, 2D/3D pose, and 3D human mesh using HRNet, OpenPose, and PyTorch3D.
- Design novel identity-aware 3D human reconstruction models to assist CCRe-ID using PyTorch and Blender.
- Propose novel attention-based learning techniques for CCRe-ID using 3D pose, 3D shape, and graph-based gait, achieving state-of-the-art performance and resulting in four 1^{st}-author papers; Implement using PyTorch.
- Implement a GAN for pose-transfer on aerial images using PyTorch, boosting drone-based Re-ID accuracy by 2%.

Texture Generation on 3D Shapes for 3D Games — *Jun 2023 - Present*

- Annonate Objaverse, a large-scale 3D dataset; Select objects based on quality and style for training using Blender.
- Modify DreamFusion to alter texture on fixed 3D meshes of game items based on text prompt using PyTorch.

Tackling Model Drift of Semantic Segmentation Models — *Apr 2023 - Oct 2023*

- Perform Image Quality Assessment using BRISQUE to filter out noisy and distorted data for model refinement.
- Modify an SVM classifier for selecting features for retraining the segmentation models; Implement in TensorFlow.

Face Recognition at Long Distance (FRaLD) | *GitHub* — *Dec 2022 - Jul 2023*

- Assess quality of aerial face images using BRISQUE; Preprocess and analyze drone-based datasets using OpenCV.
- Design a pose-guided model based on ArcFace, improving 4% accuracy for FRaLD; Implement using PyTorch.

Fetal ECG Extraction using Pix2Pix GAN | *GitHub* — *Oct 2022 - May 2023*

- Analyze, filter, and transform 1D ECG signals into 2D spectrogram images using SciPy, NumPy, and MATLAB.
- Build an ECG extraction model on Pix2Pix GAN, outperforming AutoEncoder-based models by 5% in accuracy.

Automated IDs and Business Cards Extractor *Feb 2021 - Mar 2022*

- Test OCR methods; Implement BERT model using PyTorch, achieving 90% accuracy in Korean and Japanese.
- Package source code into Docker Image; Write API using FastAPI; Deploy model with TensorFlow using ONNX.

Selected Publications

Accepted for publication

1. **V. D. Nguyen**, K. Khaldi, D. Nguyen, P. Mantini, and S. Shah. (2024) Contrastive Viewpoint-aware Shape Learning for Long-term Person Re-Identification. In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV).*

2. **V. D. Nguyen**, P. Mantini, and S. Shah. (2024) Temporal 3D Shape Modeling for Video-based Cloth-Changing Person Re-Identification. In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) Workshop.* [Github].

3. K. Khaldi, **V. D. Nguyen**, P. Mantini, and S. Shah. (2024) Unsupervised Person Re-Identification in Aerial Imagery. In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) Workshop.*

4. **V. Nguyen**, A. Ho, A. Vu, A. Nguyen, and T. Tran. (2023) Building Footprint Extraction in Dense Areas using Super Resolution and Frame Field Learning. In *12th International Conference on Awareness Science and Technology.* [*Best paper award*] [Paper].

Submitted

1. **V. D. Nguyen**, P. Mantini, and S. Shah. (**submitted to CVPR 2024**). Cross-Modality Spatial-Temporal Collaborative Learning for Video-based Cloth-Changing Person Re-Identification.

2. **V. D. Nguyen**, S. Mirza, P. Mantini, and S. Shah. (**submitted to VISAPP 2024**). Attention-based Shape and Gait Representations Learning for Video-based Cloth-Changing Person Re-Identification.

3. S. Mirza, **V. D. Nguyen**, P. Mantini, and S. Shah. (**submitted to VISAPP 2024**). Data Quality Aware Approaches for Addressing Model Drift of Semantic Segmentation Models.

Honors and Awards

Cullen Graduate Student Success Fellowship: Awarded by College of Natural Sciences and Mathematics, UH.

FPT Young Talents Scholarship: Awarded by FPT Group for outstanding undergraduate researcher.

Leadership

College of Natural Sciences and Mathematics, UH: CS Graduate Student Representative *Aug 2023 - present*

Computer Science Graduate Student Association, UH: Secondary Student Officer *Aug 2022 - present*