Anh Phan Nguyen

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Professional Summary

- AI Engineer with hands-on experience in developing Deep Learning and Large Language Models, from requirements gathering and prototyping to deployment.
- Proven track record of publishing high-quality research at top conferences in multimedia and security, such as ACM MM and NDSS.
- Software Development and Machine Learning Skills: Python, C++, (No)SQL, LLMs, Deep Learning.

Work Experience

Trillion Technology Solutions McLean, VA
Generative AI Engineer *May 2024 - Present*

- **Synthetic Data Generation for Production System Testing**: Designed and implemented an LLM-based data synthesis tool to generate diverse test scenarios, improving test coverage.
  - ☞ Led requirements gathering, algorithm design, and rapid prototyping phases.
  - ☞ Collaborated with infrastructure engineers to deploy the solution.
  - ☞ Performed rigorous evaluation of data generation metrics to optimize model performance. Published findings on arXiv.
- **LLM-Powered Grant Writing System**: Developed an AI-assisted grant proposal system that increased proposal throughput and improved alignment with RFQs.
  - ☞ Gathered requirements from the proposal writing team. Formulated narratives and designed the initial architecture.
  - ☞ Generated initial north star sample proposals, collected feedback, and iteratively refined requirements.

Scriptchain Health San Francisco Bay Area, CA
Machine Learning/AI Engineer Intern *Jan 2024 - May 2024*

- **Heart Disease Readmission Prediction**: Led the proposal/implementation of LLM models to predict heart disease readmissions.
  - ☞ Implemented LLM model to process time-series data from patients' health records, ensuring reliable predictions for highly imbalanced data.
  - ☞ Researched and implemented security and privacy requirements to ensure that both the LLM model and the organization comply with standards such as HIPAA, SOC-2, and FIPS 140-2.
  - ☞ Deployed LLM model to production via SageMaker, ensuring its constant availability and scalability.

VNG Corporation Hochiminh, Vietnam
Senior Data Scientist *Oct 2016 - Jun 2017*

- **Recommendation for Social Network**: Enhanced user engagement on Zalo's social network by identifying and leveraging positive social links among millions of users.
  - ☞ Developed a graph-based analysis framework and implemented random forest algorithms to predict the formation of positive social links leading to friend requests.
  - ☞ The graph-based analytical framework accelerated social network analysis by 10x, while the random forest algorithms achieved a 10% improvement in predicting positive social links.
- **Trader Detection**: Developed and implemented Bayesian classifiers to accurately identify traders within the Zalo social network.
  - ☞ Enabled better allocation of resources to users based on their classifications.

George Mason University/Georgia State University Fairfax, VA
Research Assistant, MEDIA Lab *Aug 2017 - Present*

- **Human Behavior in Virtual Reality**: Pioneered a Deep Learning framework using a saliency-based DCNN model for precise estimation of human attention in VR.
  - ☞ This project became a cornerstone for various computer vision systems, garnering over 160 scholarly citations from diverse research groups.

- **360 Video Streaming with Head Movement Prediction**: Proposed LSTM-based time-series models leveraging visual saliency to accurately forecast future head movements.
  ☞ Achieved 31% better bandwidth utilization and notable enhancements in the quality of VR streaming experiences for systems using this model.
- **Optimize 360 Video Streaming**: Engineered client-based super-resolution models to enhance video content quality and employed adaptive control algorithms to balance complex external factors affecting video streaming.
  ☞ Led to a 50% improvement in the quality of experience (QoE) for users, particularly under conditions of fluctuating bandwidth and low bitrate.
- **360 Video Analysis for Firefighter Training**: Developed fast, robust, and high-performance Deep Learning models for identifying firefighting-related objects in 360 videos. Collaborated with experts, firefighters, and researchers from multiple institutions in Virginia and Illinois.
  ☞ Enhanced training effectiveness and safety by supporting trainers and firefighters in rapidly identifying human errors during live training exercises.

Sentifi Hochiminh, Vietnam
Data Scientist/Data Engineer *Oct 2015 - Oct 2016*

- **Ranking in Social Network**: Engineered a ranking algorithm to analyze millions of Twitter profiles, targeting potential influencers in the fintech sector.
  ☞ Employed regression algorithms to assess the overall impact of each profile based on tweet features.
  ☞ Enabled the company to accurately monitor and understand fintech trends and activities on Twitter, improving the relevance and precision of information promoted on websites.
- **Organization Detection**: Developed machine learning classifiers to identify Twitter users representing organizations. Collaborated with the data engineering team to integrate the predictive model into the existing data processing pipeline.
  ☞ Significantly accelerated the company's internal data processing rate.
- **System Optimization**: Led a comprehensive optimization of NoSQL and SQL database queries for the ranking system.
  ☞ Addressed bottlenecks caused by simultaneous access to five different databases. Collaborated closely with the backend team to refine system source code and queries.
  ☞ This initiative resulted in a 30% improvement in the overall running time of the system.

University of Science Hochiminh, Vietnam
Instructor of Record *Aug 2009 - Aug 2013*

TMA Solutions Hochiminh, Vietnam
Web Developer *Sep 2008 - Aug 2009*

- **Web Programming**: Developed websites supporting mobile paramedical examiners. Successfully delivered core functionalities.
- **Skills**: Visual Studio C# .NET, Subversion, Javascript, SQL

Education

George Mason University Fairfax, VA, USA
Ph.D. in Information Science/Computer Science *Aug 2017 - May 2024*
Research Focus: Deep Learning/Security for Virtual Reality and Video Systems

University of Pittsburgh Pittsburgh, PA, USA
Master of Science in Computer Science *Aug 2013 - Aug 2015*

University of Science Ho Chi Minh City, Vietnam
Bachelor of Science in Information Technology *Sep 2004 - Aug 2008*

Leadership and Mentoring Experience

- **Undergraduate Mentorship Summer 2022**: Led and mentored a team of undergraduate students in developing a 360 Video Annotator tool, which significantly enhances the efficiency of annotating bounding boxes for object detection tasks in 360 videos.
- **Undergraduate Mentorship Summer 2021**: Mentored undergraduate students in developing a predictive model to determine the most engaging parts of a video. This model leverages motion vectors in video encoding standards, making it both rapid and cost-efficient.
- **Instructor of Record**: Delivered lectures to classes of up to 90 students.

Projects

– **Vehicular Video Delivery**: Developed a trajectory-aware video caching system using Software-Defined Networking (SDN) to enhance video streaming in vehicular networks.

☞ Implemented predictive algorithms for vehicular movement to dynamically route streaming data to nearby edge servers, ensuring a seamless streaming experience in moving vehicles.

Selected Published Paper

– **Anh Nguyen**, Zhisheng Yan, and Klara Nahrstedt. "Your attention is unique: Detecting 360-degree video saliency in head-mounted display for head movement prediction." Proceedings of the 26th ACM international conference on Multimedia. 2018.

– Luo, Shiqing, **Anh Nguyen**, Chen Song, Feng Lin, Wenyao Xu, and Zhisheng Yan. "OcuLock: Exploring human visual system for authentication in virtual reality head-mounted display." In 2020 Network and Distributed System Security Symposium (NDSS). 2020.

– Taslim Murad, **Anh Nguyen**, and Zhisheng Yan. "DAO: Dynamic Adaptive Offloading for Video Analytics." Proceedings of the 30th ACM International Conference on Multimedia. 2022.

– **Anh Nguyen**, and Zhisheng Yan. "Enhancing 360 Video Streaming through Salient Content in Head-Mounted Displays." Sensors 23.8 (2023): 4016.

– **Anh Nguyen**, and Zhisheng Yan. "A saliency dataset for 360-degree videos." Proceedings of the 10th ACM Multimedia Systems Conference. 2019.

– **Anh Nguyen**, Xiaokuan Zhang, and Zhisheng Yan. "Penetration Vision through Virtual Reality Headsets: Identifying 360 Videos from Head Movements." USENIX'24 (2024). **(Accepted)**

– Shiqing Luo, **Anh Nguyen**, Halsa Farooq, Kun Sun, and Zhisheng Yan. 2024, February. Eavesdropping on Controller Acoustic Emanation for Keystroke Inference Attack in Virtual Reality. In The Network and Distributed System Security Symposium (NDSS).**(Distinguished Paper Award)**