BUU TRUONG PHAN

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About me: I am a researcher in deep learning and computer vision, specialized in 3D object detection, uncertainty and adversarial robustness. Other interested research topics include: graph-based learning, matrix methods, information theory, optimization and probability.

Main toolkits and libraries: Python, Tensorflow, Pytorch, scikit-learn, C/C++, Git/Github, OpenCV, Docker.

PROFESSIONAL EXPERIENCES

LG Electronics AI Lab May 2021 - Now
AI Research Engineer *Canada*

- Developed a novel and occlusion-aware neural architecture for human pose estimation.
- Fast-prototype multiple AI solutions and export deep learning models for production.
- Research on out-of-distribution detection and graph-based learning.

Algolux Oct 2019 - May 2021
Research Scientist - Deep Learning and Computer Vision *Canada*

- My role is to research and implement computer vision technologies for self-driving cars (3D stereo object detection, segmentation, tracking, etc.)
- Formulated and developed a new optimization algorithm for black-box adversarial attack that targets a specific ISP module.
- Proposed and developed a neural network model for the hidden objects tracking problem using radar (non-line-of-sight imaging). Project Link.
- Developed and benchmarked different object detection architectures.
- Developed active learning algorithms for object detection.

Waterloo Intelligent Systems Engineering Lab, University of Waterloo Sep 2017 - Sep 2019
Graduate Research Assistant *Canada*

- Researched in the area of Bayesian deep learning, image segmentation, active learning and anomaly detection. My thesis studies different aspects of Bayesian deep learning model in the context of road-scene image segmentation. Thesis Link.
- Formulated and developed a distillation technique for Bayesian neural networks.
- Developed a camera obstruction detection model and integrated it from Tensorflow to C++.
- Developed functionalities for the Autonomoose self-driving car platform (Project Autonomoose).

BlueSeed Digital Dec 2016 - Jul 2017
Data Scientist Intern *Vietnam*

- I developed machine learning models for market segmentation and topic modelling. I also integrated the model into production using Spark technologies.

EDUCATION

University of Waterloo *Sep 2017 - Sep 2019*
Master of Applied Science, Advisor: Prof. Krzysztof Czarnecki Overall GPA: 93.17/100
Specialization: Pattern Analysis and Machine Intelligence
International University - Vietnam National University *Sep 2012 - Sep 2016*
B.Eng in Electrical Engineering (summa cum laude) Overall GPA: 91.5/100

PUBLICATIONS

1. **Buu Phan**, Fahim Mannan and Felix Heide. "Adversarial Imaging Pipelines." CVPR, 2021.
2. Nicolas Scheiner, Florian Kraus, Fangyin Wei, **Buu Phan**, Fahim Mannan, Nils Appenrodt, Werner Ritter et al. "Seeing Around Street Corners: Non-Line-of-Sight Detection and Tracking In-the-Wild Using Doppler Radar." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp. 2068-2077. 2020. https://www.cs.princeton.edu/~fheide/DopplerNLOS/.
3. **Buu Phan**, Samin Khan, Rick Salay, and Krzysztof Czarnecki. "Bayesian uncertainty quantification with synthetic data." In International Conference on Computer Safety, Reliability, and Security, pp. 378-390. Springer, Cham, 2019. **Best paper award at the Second International Workshop on Artificial Intelligence Safety Engineering**.

4. Samin Khan, **Buu Phan**, Rick Salay, and Krzysztof Czarnecki. "ProcSy: Procedural Synthetic Dataset Generation Towards Influence Factor Studies Of Semantic Segmentation Networks." In CVPR Workshops, pp. 88-96. 2019.
5. Sachin Vernekar, Ashish Gaurav, Taylor Denouden, **Buu Phan**, Vahdat Abdelzad, Rick Salay, and Krzysztof Czarnecki. "Analysis of confident-classifiers for out-of-distribution detection." ICLR SafeML Workshop 2019.
6. **Buu Phan**, Rick Salay, Krzysztof Czarnecki, Vahdat Abdelzad, Taylor Denouden, Sachin Vernekar, "Calibrating Uncertainties in Object Localization Task", NeurIPS Bayesian Deep Learning Workshop, 2018.
7. Ian Colwell, **Buu Phan**, Shahwar Saleem, Rick Salay, and Krzysztof Czarnecki. "An automated vehicle safety concept based on runtime restriction of the operational design domain." In 2018 IEEE Intelligent Vehicles Symposium (IV), pp. 1910-1917. IEEE, 2018.

PREPRINTS

1. Abdelzad, Vahdat, Krzysztof Czarnecki, Rick Salay, Taylor Denounden, Sachin Vernekar, and **Buu Phan**. "Detecting Out-of-Distribution Inputs in Deep Neural Networks Using an Early-Layer Output." arXiv preprint arXiv:1910.10307 (2019).
2. Denouden Taylor, Rick Salay, Krzysztof Czarnecki, Vahdat Abdelzad, **Buu Phan**, and Sachin Vernekar. "Improving reconstruction autoencoder out-of-distribution detection with mahalanobis distance." arXiv preprint arXiv:1812.02765 (2018).

AWARDS, SCHOLARSHIPS & ACHIEVEMENTS

- Best paper award, Workshop on Artificial Intelligence Safety Engineering 2019
- Toyota Canada Graduate Scholarship 2018-2019
- NSERC CREATE, Student Grant 2018-2019
- Faculty of Engineering Awards for top graduate students, University of Waterloo 2018, 2019
- International Master's Student Awards, University of Waterloo 2017-2019
- Graduate Research Studentship, University of Waterloo 2017
- Honor Student Award, Vietnam National University 2016
- Valedictorian, International University 2016