VAN VUNG PHAM

SUMMARY OF STATEMENT OF RESEARCH INTERESTS

My areas of expertise centered around machine learning, deep learning, data visualizations, and data analytics. My skill set holds a unique place in computer science because I have worked with different stages in a production pipeline of a complete machine learning solution for various problem domains. They are 1) data exploration, 2) building machine learning/deep learning models, 3) interpreting/explaining the learned models, and 4) reporting results to the public. My experience in writing funding proposals also prepared me to seek and develop a strong, externally funded research program.

SUMMARY OF TEACHING PHILOSOPHY STATEMENT

My curriculum development experience builds up my philosophy regarding student learning goals. Also, more than eight years of teaching experience equips me with a set of methods for enactment and assessment of these learning goals. Furthermore, my international educational background (I am an international student who studied my Bachelor's in Indonesia, had my Master's in Italy, and is taking my Ph.D. in the United States) and my teaching experience in an international collaboration program allow me to appreciate the importance of an inclusive learning environment. I love teaching and would like to learn and add more to my experience in my future endeavor to effectively educate students with knowledge, skills, and attitudes ready for the future workforce.

SUMMARY OF QUALIFICATIONS

- *Teaching:* More than eight years of teaching experience; 3 consecutive employee-of-the-year awards
- *Management and Curriculum Development:* Led the academic department of the FPT Greenwich Collaboration Programs, FPT University, Hanoi, Vietnam; led a team to develop the curriculum for the first two years of this program, which is currently being delivered.
- *Research:* Won Silver Prize as data contributor and Bronze Prize as model contributor in the IEEE BigData 2022 Cup challenges, won one best paper award, won an award in VAST 2018 Mini-Challenge 2, won honorable prizes in KDD 2020 Cup and BigData 2020 Cup challenges, and achieved Spirits of NSF I-Corps award, has one patent application in data visualization methods and devices.
- *Writing proposal:* Helped advisor write an NSF I-Corps proposal and executed it as an Entrepreneur Lead; helped advisor write a Partnership for Innovation – Technology Translation (PFI-TT) Proposal (currently under review, submitted on Feb 10, 2021).
- *Areas of expertise:* Data Analytics, Data Visualizations, Machine Learning, and Deep Learning.

SKILLS

- Experience teaching various Computer Sciences courses in higher education institutions with a racially, culturally, and economically diverse student body.
- Strong interdisciplinary research profile in various domains related to data analytics, data visualizations, machine learning, and deep learning.
- Strong programming skills: Python, JavaScript, and Java.

EDUCATION

- Ph.D. in Computer Science, Texas Tech University, Texas, USA (2021)
- Master of Science in Computing Systems Engineering, Politecnico di Milano, Milan, Italy (2010)
- Bachelor of Science in Information Technology, President University, Indonesia (2005)

RESEARCH EXPERIENCE

08/2021 - Present:

Position: Assistant Professor, Computer Science Department, Sam Houston State University, Huntsville, Texas, USA.

Responsibilities: Teach undergraduate/graduate courses in Computer Science; research and seek external funding; provide services to the department and university.

06/2018 – 08/2021 (part-time):

Position: Research Assistant at Interactive Data Visualization Lab, Computer Science Department, Texas Tech University, Lubbock, Texas, USA.

Responsibilities/achievements: Researching on data analytics, data visualizations, machine learning, and deep learning; completed several projects and had one patent application, three peer-reviewed journals, one book chapter (currently under reviewed), and 24 peer-reviewed conference papers.

TEACHING AND SUPERVISING EXPERIENCE

08/2021 – present (full-time):

Position: Assistant Professor, Computer Science Department, Sam Houston State University, Huntsville, Texas, USA.

Responsibilities: Teach undergraduate/graduate courses in Computer Science; research and seek for external funding; provide services to the department and university.

09/2010 – 06/2018 (full-time):

Position: Lecturer, FPT Greenwich Collaboration Centre, FPT University, Hanoi, Vietnam

Responsibilities/achievements: Taught several Bachelor of Science (Honours) courses in Computing; consistently achieved high student evaluation scores across all teaching years (3.9/4.0); supervising undergraduate students.

Taught undergraduate courses from Sam Houston State University

1. COSC 3321 – Digital System Design
2. COSC 3318 – Database Management Systems
3. COSC 2347 – Special Topics/Programming (Python)
4. COSC 1436 – Programming Fundamentals I (Java)

Taught undergraduate courses from FPT University:

5. Programming in Java
6. Procedural Programming in C
7. Object Oriented Programming
8. Data Structures and Algorithms
9. Database Design and Concepts
10. Database Engineering
11. Web Application Development
12. Mobile Application Development
13. Distributed Information Systems
14. Interaction Design
15. Project Design, Implementation and Evaluation

ADMINISTRATIVE EXPERIENCE

04/2013 – 04/2018 (full-time):

Position: Head of the Academic Department, FPT Greenwich Collaboration Centre, Bachelor of Science (Honours) in Computing collaboration program between University of Greenwich (UK) and FPT University (Vietnam).

Responsibilities/achievements: Managing lecturers and academic staff in the department; developed the curriculum for the first two years of this collaboration program, which is currently being delivered.

UNIVERSITY SERVICE

Sam Houston State University, Huntsville, Texas, US

- UCC and GCC Committee Member
- Advisor for ACM Chapter At Sam Houston State University (ACM@SAM)

Texas Tech University, Lubbock, US

Part of the team that developed and currently operating the TTU SMS Recruitment Portal. This system helps Whitacre college of engineering (with 7 Departments) communicate with prospective students.

FPT University, Hanoi, Vietnam

Liaison to the International Partners for the FPT Greenwich Collaboration Program.

HONORS AND AWARDS

- **Award**: Silver prize as a data contributor in IEEE BigData Cup 2022 – Crowdsensing-based Road Damage Detection Challenge (https://crddc2022.sekilab.global/leaderboard/).
- **Award**: Shortlisted winners (top 10% among 121 participated teams) in IEEE BigData Cup 2020 – Global Road Damage Detection (https://rdd2020.sekilab.global/leaderboard/).
- **Award**: Honorable prize (7th place among 549 participants) in KDD Cup 2020 – Graph Adversarial Attack and defense (https://www.biendata.xyz/competition/kddcup_2020/winners/).
- **Award**: Spirits of NSF I-Corps, Bay Area National I-Corps, Spring 2020, for the team most exemplifying hard work, discipline, and intellectual honesty. Role: Entrepreneurial Lead.
- **Award**: Best paper, EnvirVis 2019, Workshop on Visualizations in Environmental Sciences, June 3, 2019, Porto, Portugal.
- **Award**: Strong Support for Exploratory Analysis, VAST Challenge 2018: Mini-Challenge 2, IEEE VIS Conference, Berlin, Germany.
- **Honorable Mention**: Representation of Small-Scale Temporal Patterns, VAST Challenge 2018: Mini-Challenge 3, IEEE VIS Conference, Berlin, Germany.
- **Full scholarship**: Ph.D. in Computer Science from Computer Science Department, Texas Tech University.
- **Full scholarship**: Master of Science in Computing Systems Engineering from Politecnico di Milano, Italy.
- **Full scholarship**: Bachelor of Science in Information Technology from President University, Indonesia.

FUNDINGS

- Source of Support: NSF, Total Amount: $50,000, Period Covered: 04/2020-10/2020, Role: Entrepreneurial Lead, Achievement: I contacted and interviewed 102 customers during this NSF I-Corps program.
- Source of Support: Institute for Homeland Security, Sam Houston State University, Total amount: $10,000, Period Covered: 05/2022 – 08/2022, Role: PI.
- Source of Support: Sam Houston State University Undergraduate Research Experience, Total Amount: $2,900, Period Covered: 05/2022-08/2022, Role: PI.

PATENT

1. **V. Pham**, T. Dang, and D. Weindorf, "Data visualization device and method (Publication Number: WO/2021/055243, Publication Date: 25.03.2021, International Application No.: PCT/US2020/050313, International Filing Date: 11.09.2020, Priority Date: 16.09.2019)," Patent.

PEER-REVIEWED PUBLICATIONS, Google scholar: https://scholar.google.com/citations?user=too4ejgAAAAJ&hl=en

Book chapters

1. **Pham, V.**, & Dang, T. (2021). JavaScript Implementation of Scagnostics and Its Applications. IntechOpen.

Journals

2. **Pham, V.**, Jordan, C. M., Siebecker, M. G., Weindorf, D. C., & Dang, T. (2022). iDVS: interactive 2D and 3D visualizations of proximal sensor data for rapid characterization of soil profiles. *Precision Agriculture*, 1-20.
3. Nguyen, H. N., Abri, F., **Pham, V.**, Chatterjee, M., Namin, A. S., & Dang, T. (2022). MalView: Interactive Visual Analytics for Comprehending Malware Behavior. *IEEE Access*.
4. **Pham, V.**, Weindorf, D. C., & Dang, T. (2021). Soil profile analysis using interactive visualizations, machine learning, and deep learning. *Computers and Electronics in Agriculture*, *191*, 106539.
5. Le, D. D., **Pham, V.,** & Dang, T. (2020, May). Securing autonomous system in multi-domain tactical environment. In *Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications II* (Vol. 11413, p. 1141320). International Society for Optics and Photonics.
6. Dang, T., **Pham, V.**, Nguyen, H. N., & Nguyen, N. V. (2020). AgasedViz: visualizing groundwater availability of Ogallala Aquifer, USA. *Environmental Earth Sciences*, *79*(5), 1-12.
7. Sun, F., Bakr, N., Dang, T., **Pham, V.,** Weindorf, D. C., Jiang, Z., ... & Wang, Q. B. (2020). Enhanced soil profile visualization using portable X-ray fluorescence (PXRF) spectrometry. *Geoderma*, *358*, 113997.
8. D. Le, **V. Pham**, H. Nguyen, and T. Dang. (2019, November). Visualization and Explainable Machine Learning for Efficient Manufacturing and System Operations. *Smart and Sustainable Manufacturing Systems* 3, no. 2 (2019): 127-147.

Conferences

9. Nguyen, D., & **Pham, V.** (2022, December). RaCAViz: Interactive Visualizations for Rapid Carbon Assessment. *In 2022 IEEE International Conference on Big Data (Big Data) (pp. 4543-4550). IEEE*.
10. **Pham, V.,** Nguyen, D., & Donan, C. (2022, December). Road Damage Detection and Classification with YOLOv7. *In 2022 IEEE International Conference on Big Data (Big Data) (pp. 4543-4550). IEEE*.
11. Martinez, E., Varol, C., Shashidhar, N., & **Pham, V.** (2022, June). Development of a Forensic Toolkit for Small-Medium Size Business (SMB). In *2022 10th International Symposium on Digital Forensics and Security (ISDFS)* (pp. 1-4). IEEE.
12. **Pham, V.**, Weindorf, D. C., & Dang, T. (2021, December). RDNet: Deep Learning Model for Predicting pH H 2 0 and pH KCl from Soil Vis-NIR Spectra. In *2021 IEEE International Conference on Big Data (Big Data)* (pp. 3436-3445). IEEE.
13. Nguyen, N. V., **Pham, V.**, & Dang, T. (2021, June). HMaViz: Human-machine analytics for visual recommendation. In *The 12th International Conference on Advances in Information Technology* (pp. 1-9).
14. **Pham, V.,** Pham, C., & Dang, T. (2020, December). Road Damage Detection and Classification with Detectron2 and Faster R-CNN. In *2020 IEEE International Conference on Big Data (Big Data)*. IEEE.
15. Pham, C., **Pham, V.,** & Dang, T. (2020, December). Graph Adversarial Attacks and Defense: An Empirical Study on Citation Graph. In the *2020 IEEE International Conference on Big Data (Big Data)*. IEEE.
16. Pham, C., **Pham, V.,** & Dang, T. (2020, October). GenExplorer: Visualizing and Comparing Gene Expression Levels via Differential Charts. In *International Symposium on Visual Computing* (pp. 248-259). Springer, Cham.
17. **Pham, V.**, Nguyen, N., & Dang, T. (2020, October). ContiMap: Continuous Heatmap for Large Time Series Data. In *2020 IEEE Visualization in Data Science (VDS)*. IEEE.
18. Dang, T., Van, H., Nguyen, H., **Pham, V.,** & Hewett, R. (2020, July). DeepVix: Explaining Long Short-Term Memory Network With High Dimensional Time Series Data. In *Proceedings of the 11th International Conference on Advances in Information Technology* (pp. 1-10).

19. **Pham, V.,** Nguyen, N. V., & Dang, T. (2020, July). Scagcnn: Estimating visual characterizations of 2d scatterplots via convolution neural network. In *Proceedings of the 11th International Conference on Advances in Information Technology* (pp. 1-9).

20. **Pham, V.,** & Dang, T. (2020). ScagnosticsJS: Extended Scatterplot Visual Features for the Web. In *Eurographics 2020 - Short Papers*. The Eurographics Association.

21. **Pham, V.,** Nguyen, V. T. N., & Dang, T. DualNetView: Dual Views for Visualizing the Dynamics of Networks. In the *2020 EuroVis Workshop on Visual Analytics (EuroVA).* The Eurographics Association.

22. **Pham, V.,** Weindorf, D., & Dang, T. (2020). SoilScanner: 3D Visualization for Soil Profiling using Portable X-ray Fluorescence. In *2020 Workshop on Visualisation in Environmental Sciences (EnvirVis)*. The Eurographics Association.

23. **Pham, V.**, Nguyen, N., Li, J., Hass, J., Chen, Y., & Dang, T. (2019, December). Mtsad: Multivariate time series abnormality detection and visualization. In *2019 IEEE International Conference on Big Data (Big Data)* (pp. 3267-3276). IEEE.

24. Pham, C., **Pham, V.,** & Dang, T. (2019, December). Solar Flare Prediction Using Two-tier Ensemble with Deep Learning and Gradient Boosting Machine. In *2019 IEEE International Conference on Big Data (Big Data)* (pp. 5844-5853). IEEE.

25. **Pham, V.**, & Dang, T. (2019, October). Outliagnostics: Visualizing Temporal Discrepancy in Outlying Signatures of Data Entries. In *2019 IEEE Visualization in Data Science (VDS)* (pp. 29-37). IEEE.

26. Nguyen, B. D., Nguyen, N. V., **Pham, V.**, & Dang, T. (2019, October). Visualization of Data from HACC Simulations by Paraview. In *2019 IEEE Scientific Visualization Conference (SciVis)* (pp. 31-32). IEEE.

27. Dang, T., Nguyen, H. N**., Pham, V**. (2019). WordStream: Interactive Visualization for Topic Evolution. In *EuroVis (Short Papers)* (pp. 103-107).

28. **Pham, V.,** & Dang, T. (2019). SOAViz: Visualization for Portable X-ray Fluorescence Soil Profiles. In *2019 Workshop on Visualisation in Environmental Sciences (EnvirVis)*. The Eurographics Association. (Best Paper Award)

29. **Pham, V.**, Nguyen, V. T., & Dang, T. (2018, December). IoTViz: Visualizing emerging topics in the internet of things. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 4569-4576). IEEE.

30. Nguyen, H. N., Nguyen, V. T., Nguyen, N. V., **Pham, V.**, & Dang, T. (2018, December). IoTNegViz: An interactive tool for visualizing negative aspects of IoT. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 4565-4568).

31. Nguyen, N. V., Nguyen, V. T., **Pham, V.**, & Dang, T. (2018, December). Finanviz: Visualizing emerging topics in financial news. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 4698-4704). IEEE.

32. Nguyen, V. T., **Pham, V.**, & Dang, T. (2018, December). Ufo_tracker: Visualizing ufo sightings. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 4352-4359). IEEE.

33. **Pham, V.**, & Dang, T. (2018, December). Cvexplorer: Multidimensional visualization for common vulnerabilities and exposures. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 1296-1301). IEEE.

34. Dang, T., Nguyen, N. V., & **Pham, V.** (2018, December). HealthTvizer: Exploring Health Awareness in Twitter Data through Coordinated Multiple Views. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 3647-3655). IEEE.

35. **Pham, V. V.**, & Dang, T. (2018, October). Mtdes: Multi-dimensional temporal data exploration system; strong support for exploratory analysis award in vast 2018, mini-challenge 2. In *2018 IEEE Conference on Visual Analytics Science and Technology (VAST)* (pp. 100-101). IEEE.

36. Dang, T., & **Pham, V. V**. (2018, October). Timematrix: Visual representation for temporal pattern detection in dynamic networks, vast 2018 mini-challenge 3. In *2018 IEEE Conference on Visual Analytics Science and Technology (VAST)* (pp. 108-109). IEEE.

CONFERENCE PRESENTATIONS

1. In *The 4ᵗʰ International Conference On Sustainable Engineering and Creative Computing (ICSECC) 2022. IEEE*.
   Keynote speaker of the talk title: Recent advancements in deep learning for computer vision.

2. In the *2022 IEEE International Conference on Big Data (Big Data) (pp. 4543-4550). IEEE*. Dec, 2022.
   Author presentation of the paper: Road Damage Detection and Classification with YOLOv7

3. In the *2020 EuroVis Workshop on Visual Analytics (EuroVA).* The Eurographics Association. May 25, 2020.

Author presentation of the paper: DualNetView: Dual Views for Visualizing the Dynamics of Networks.
4. In the *2020 IEEE International Conference on Big Data (Big Data)*. IEEE, December 2020.
Author presentation of the paper: Road Damage Detection and Classification with Detectron2 and Faster R-CNN.
5. In *2020 IEEE Visualization in Data Science (VDS)*. IEEE. October 2020.
Author presentation of the paper: ContiMap: Continuous Heatmap for Large Time Series Data.
6. In *11th International Conference on Advances in Information Technology, July 1-3, 2020.*
Author presentation of the paper: Scagcnn: Estimating visual characterizations of 2d scatterplots via convolution neural network.
7. In *2020 Workshop on Visualisation in Environmental Sciences (EnvirVis)*. The Eurographics Association. May 25, 2020.
Author presentation of the paper: SoilScanner: 3D Visualization for Soil Profiling using Portable X-ray Fluorescence.
8. In *Eurographics 2020, May 25-29, 2020.*
Author presentation for the paper: ScagnosticsJS: Extended Scatterplot Visual Features for the Web.
9. In *2018 IEEE Conference on Visual Analytics Science and Technology (VAST)*, 21-26 October 2018.
Author presentation of the paper: MTDES: Multi-dimensional temporal data exploration system
Author presentation of the paper: Timematrix: Visual representation for temporal pattern detection in dynamic networks

PROFESSIONAL DEVELOPMENT

- **Engaged Faculty Certificate**: This five-day workshop provides faculties with theories and hands-on experience with teaching techniques that engage students in learning.

- **International Teaching Assistant Certificate:** This intensive three-week workshop assesses the participant's English proficiency. I passed and am APPROVED to teach at Texas Tech University.

- **Google TensorFlow Developer Certificate:** This exam covers fundamental, practical machine learning skills by building and training models using TensorFlow.