Huy Hieu Pham | Curriculum Vitæ

Research Scientist in Computer Vision and Artificial Intelligence

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Education

2016 ÷ 2019 — **Ph.D. in Computer Science**
Toulouse Computer Science Research Institute (IRIT) - The University of Toulouse & Cerema Research Center, France.
Dissertation: *"Human Action Recognition in RGB-D Videos based on Deep Neural Networks"*.
| Detailed description

2010 ÷ 2015 — **Bachelor of Engineering in Industrial Informatics**
Center for Training of Excellent Students (CTES), Hanoi University of Science and Technology (HUST), Vietnam.
Thesis: *"Obstacle Detection in Indoor Environment for Visually Impaired People"*, done at the Université Grenoble Alpes, France with the maximum score of A+.
| Detailed description

Research Interests

My research interests lie in the intersection of Computer Vision and Machine/Deep Learning. Much of my research is about understanding the physical world (shape, depth, motion, object detection and recognition) from images and videos. I have also worked in Medical Imaging projects.

Work Experience

Sep. 2020 ÷ PRESENT — **Affiliated Faculty** at VinUniversity (VinUni)

- Conducting Joint Research Projects between VinBigdata and VinUni.

Oct. 2019 ÷ PRESENT — **Research Scientist** at the Vingroup Big Data Institute

- Design and implement Computer Vision and Deep Learning approaches to solving particular medical imaging problems related to detection, segmentation and classification in medical imaging.
- Construct and normalize large-scale medical datasets (X-ray, CT, MRI, etc).
- Produce top tier technical/clinical publications and transfer ML/DL models into products.
- Techniques & Tools: Pytorch, CNNs.

Oct. 2016 ÷ Sep. 2019 — **Ph.D. Fellow** at the Toulouse Computer Science Research Institute (IRIT) - The University of Toulouse & Cerema Research Center, Toulouse, France.

- Conduct research on video-based human action recognition using deep learning networks.
- Proposed new 3D motion representations and deep learning frameworks for action analysis.
- Techniques & Tools: CNNs, Python, Keras/TensorFlow, Kinect sensor, RGB-D data.

Nov. ÷ Dec. 2017 — **Visiting Ph.D. Student** at the Applied Artificial Intelligence Research Group, University Carlos III of Madrid, Madrid, Spain.

- Designed and optimized very deep CNNs for image recognition tasks.
- Techniques & Tools: Inception-ResNet-(v1,v2), DenseNet, Python, Keras/TensorFlow, 3D data.

Nov. 2014÷ May 2015 — **Research Intern** in the AIR-COBOT project, led by AIRBUS Group and ICA Research Institute, Albi, France.

- Analyzed 3D point cloud for detection and characterization of defects on airplane surface.
- Techniques & Tools: Object detection, 3D point cloud processing, PCL/C++, OpenCV/C++.

July ÷ Oct. 2015 — **Research Engineer** at the MICA International Research Center, Hanoi, Vietnam.

- Conducted research on object detection, 3D video analysis, and scene understanding.
- Techniques & Tools: Object detection, RGB-D videos analysis, OpenCV/C++, PCL/C++.

Feb. ÷ June 2015 — **Research Intern** at the AGIM Laboratory, Université Grenoble Alpes, Grenoble, France.

- Developed an obstacle detection and warning system for visually impaired people based on electrode matrix and mobile Kinect.
- Techniques & Tools: 3D object segmentation, OpenCV/C++, PCL/C++, Kinect, RGB-D data.

Scholarships and Awards

Sep. 2019	**Rank 1st** in the CheXpert competition, organized by Stanford University. More details about this project can be found at VnExpress.
Jul. 2018	**Silver Medal** (top **3%** accuracy) for the TGS Salt Segmentation Challenge, Kaggle competition.
Sep. 2016	**Ph.D. Scholarship** for an outstanding candidate from the Cerema Research Center, France.
Jan. 2015	**Doctoral Travel Scholarship** from L'Université Fédérale Toulouse Midi-Pyrénées and Écoles des Docteurs, Toulouse, France.
Sep. 2015	**Research Internship Scholarship** from the ICA Research Institute, France.
Jan. 2015	**Graduate Internship Scholarship** from the Université Grenoble Alpes, France.

Languages

Native Vietnamese speaker and fluent in both French and English.

Technical Skills

Computer Vision:	Experience with detection, tracking, classification & segmentation algorithms.
Deep Learning:	Familiarity with state-of-the-art CNN architectures (*e.g.*, VGG-Net, Inception, ResNet, Inception-ResNet-(v1,v2), DenseNet, Xception, NAS-Net, AutoML, etc.), LSTM-RNNs, and Temproal Convolutional Networks (TCN).
Programming Languages:	Python, C/C++, MATLAB, and LaTeX2e.
Libraries/Frameworks:	Keras/TensorFlow, OpenCV, NumPy, SciPy, Pandas, Scikit-learn, and Matplotlib.

Scientific Publications

Journal publications

[J-8] **Hieu H. Pham**, Tung T. Le, Dat Q. Tran, Dat T. Ngo, Ha Q. Nguyen A. Velastin. *"Interpreting chest X-rays via CNNs that exploit disease dependencies and uncertainty labels"* – Neurocomputing | Accepted,to appear

[J-7] **Huy-Hieu Pham**, Houssam Salmane, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"A Unified Deep Framework for Joint 3D Pose Estimation and Action Recognition from a Single RGB Camera"* – Special Issue Camera as a Smart-Sensor (Volume 20, Issue 7), Intelligent Sensors 2020 | Accepted

[J-6] **Huy-Hieu Pham**, Houssam Salmane, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Spatio-Temporal Image Representation of 3D Skeletal Movements for View-Invariant Action Recognition with Deep Convolutional Neural Networks"* – Special Issue "Deep Learning -Based Image Sensors", Intelligent Sensors | Accepted

[J-5] **Huy-Hieu Pham**, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Learning to Recognize 3D Human Action from A New Skeleton-based Representation Using Deep Convolutional Neural Networks"* – The IET Computer Vision Journal (**IET 2018**) | Accepted

[J-4] **Huy-Hieu Pham**, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Exploiting Deep Residual Networks for Human Action Recognition from Skeletal Data"* – The Computer Vision and Image Understanding Journal, Vol. 170 (51-66), 2018 **(CVIU 2018)** | .pdf

[J-3] Igor Jovancevic, **Huy-Hieu Pham**, Jean-José Orteu, Rémi Gilblas, Jacques Harvent, Xavier Maurice, Ludovic Brèthes. *"3D Point Cloud Analysis for Detection and Characterization of Defects on Airplane Exterior Surface"* – Journal of Nondestructive Evaluation, Vol. 36 (74), 2017 **(JNE 2017)** | .pdf

[J-2] Igor Jovancevic, **Huy-Hieu Pham**, Jean-José Orteu, Rémi Gilblas, Jacques Harvent, Xavier Maurice, Ludovic Brèthes. *"Détection et Caractérisation de Défauts de Surface par Analyse des Nuages de Points 3D Fournis par Un Scanner"* - La revue Instrumentation, Mesure, Métrologie, Vol. 16 (1-4), 2017 **(I2M 2017)** | .pdf

[J-1] **Huy-Hieu Pham**, Thi Lan Le, and Nicolas Vuillerme. *"Real-Time Obstacle Detection System in Indoor Environment for Visually Impaired Sensor Using Microsoft Kinect"* – The Journal of Sensor, Vol. 11 (1-13), 2016 **(SCIE 2016)** | .pdf

Peer-reviewed conference publications

[C-3] **Hieu H. Pham**, Tung T. Le, Dat Q. Tran, Dat T. Ngo, Ha Q. Nguyen. *"Interpreting chest X-rays via CNNs that exploit disease dependencies and uncertainty labels"* – Proceedings of Medical Imaging with Deep Learning (**MIDL 2020**) | .pdf

[C-2] **Huy-Hieu Pham**, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Skeleton to Color Map: A Novel Representation for 3D Action Recognition with Inception Residual Networks"* – The 25th IEEE International Conference on Image Processing 7-10 October, 2018, Athens, Greece (**ICIP 2018**) | .pdf

[C-1] **Huy-Hieu Pham**, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Learning and Recognizing Human Action from Skeleton Movement with Deep Residual Neural Networks"* – The 8th International Conference of Pattern Recognition Systems, 11-13 July, 2017, Madrid, Spain (**ICPRS 2017**) | .pdf

Preprints

[P-1] **Huy-Hieu Pham**, Houssam Salmane, Louahdi Khoudour, Alain Crouzil, Pablo Zegers, Sergio A. Velastin. *"Deep Learning Architectures for Video-based Human Action Recognition: Challenges, Achievements, and New Frontiers"* | arXiv submit/2519965

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Review Activities

Journal of Electronic Imaging (JEI) IET Computer Vision Journal (IET-CVI)

Invited Talks, Workshops & Summer School

Dec. 2018 Invited speaker, *"Applied Machine Learning Days"* at the French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR), Paris, France.

Nov. 2017 Invited speaker, *"An Introduction to Deep Learning for Image and Video Interpretation"* at the University Carlos III of Madrid (UC3M), Madrid, Spain.

July 2018 *"The 2nd International Summer School on Deep Learning"*, Genova, Italy.

DEC. 2017 *"Workshop on Face, Action and Behavior Recognition"*, Télécom ParisTech, Paris, France.

June 2018 *"Deep Learning Workshop"*, Toulouse Computer Science Research Institute (IRIT), Toulouse, France.

Teaching

Fall 2017 *"Deep Learning for Video Analysis"* at the University Carlos III of Madrid (UC3M), Spain.

Fall 2018 *"Introduction to Programming and Algorithms in Python"* at the Paul Sabatier University (UPS), France.

Scientific Societies

I am a member of the IEEE Computer Society and the French Information, Signal, Image et Vision Society.

References

References available upon request.

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