Trong N. **Nguyen**

Post-doctoral Researcher at University of Montreal

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Summary

Experience in **computer vision** and **machine learning**, especially **deep learning**. Expert in **anomaly detection** in surveillance videos and **human gait analysis** for healthcare. Great passion for machine intelligence. Friendly, self-motivated and independent.

Work Experience

DIRO, University of Montreal (UdeM)

Montreal, QC, Canada

Post-doctoral Researcher

Jan. 2020 - Present

- Design deep neural networks for anomaly detection in surveillance videos.
- Build a system of motion evaluation supporting elderly under in-home environment.
- Publish papers indicating these works in conferences and/or journals.
- Advise students in research involving human gait analysis using computer vision.

Danang University of Science and Technology

Danang, Vietnam

Research Assistant

Jul. 2014 - Aug. 2015

- Developed algorithms for recognizing hand gestures in both static and dynamic forms.
- Performed data acquisition for hand gestures (in binary and depth representations).
- Published papers and gave presentations in scientific conferences.
- Advised students working on other vision-related projects in the laboratory.

DIRO, University of Montreal (UdeM)

Montreal, QC, Canada

Student Intern

Mar 2014 - Jun. 2014

- Proposed and implemented an algorithm for gait analysis using a color camera.
- Performed data acquisition for multiple walking gait types.
- Published papers and gave presentations in scientific conferences.

Education

DIRO, University of Montreal (UdeM)

Montreal, QC, Canada

Ph.D. in Computer Science

Sep. 2015 - Dec. 2019

- Designed a 3D reconstruction system consisting of a depth camera and two mirrors.
- Proposed algorithms reducing depth distortion caused by the Time-of-Flight depth estimation and mirrors.
- Performed data acquisition and gait analysis on 3D point clouds representing human walking gaits.
- Worked on side project of anomaly detection using deep learning.

The University of Danang (UD)

Danang, Vietnam

M.Sc. in Computer Science

Dec. 2012 - Jan. 2015

- Worked on typical image processing and machine learning algorithms.
- Performed human gait assessment based on sequence of 2D silhouettes.
- Built hidden Markov models representing the transition of postures within a gait cycle.

Danang University of Science and Technology

Danang, Vietnam

B.Sc. in Information Technology

Sep. 2007 - Jun. 2012

- Designed hand-crafted features from images and worked on vanilla neural networks.
- Developed an application for detecting fake-folder computer viruses based on their icons.

Honors & Awards

2019	**Annual**, Scholarship for end of doctoral study	*FESP, University of Montreal*
2019	**Winter semester**, Scholarship for excellent academic record	*DIRO, University of Montreal*
2018	**Winter & Fall**, Scholarship for excellent academic record	*DIRO, University of Montreal*
2017	**Winter & Fall**, Scholarship for excellent academic record	*DIRO, University of Montreal*
2016	**Winter & Fall**, Scholarship for excellent academic record	*DIRO, University of Montreal*
2015	**Fall semester**, Scholarship for excellent academic record	*DIRO, University of Montreal*
2012	**Third prize**, The 8th Scientific Research Contest for students	*The University of Danang*

Skills

Libraries/Tools PyTorch, TensorFlow, OpenCV, Caffe, Scikit-learn, GitHub, Unity, Point Cloud Library
Programming Python, MATLAB, C++, C#, Mathematica
Languages Vietnamese, English, French (basic)

Invited Reviewer

Journal **IEEE**, Transactions on Neural Systems and Rehabilitation Engineering
Journal **IEEE**, IEEE Access
Journal **Elsevier**, Journal of Biomechanics
Journal **Springer**, SN Applied Sciences
Journal **MDPI**, Sensors
Journal **MDPI**, Applied Sciences

Selected Publications

Anomaly Detection in Video Sequence with Appearance-Motion Correspondence — **ICCV 2019**
Trong-Nguyen Nguyen and Jean Meunier — paper | arXiv | GitHub | demo

Hybrid Deep Network for Anomaly Detection — **BMVC 2019**
Trong-Nguyen Nguyen and Jean Meunier — paper | arXiv | GitHub | demo | slides

Applying Adversarial Auto-encoder for Estimating Human Walking Gait Abnormality Index — **PAA (Springer), 2019**
Trong-Nguyen Nguyen and Jean Meunier — paper | arXiv | GitHub

Estimation of Gait Normality Index based on Point Clouds through Deep Auto-Encoder — **JIVP (Springer), 2019**
Trong-Nguyen Nguyen and Jean Meunier — paper | GitHub

Measurement of Human Gait Symmetry using Body Surface Normals Extracted from Depth Maps — **Sensors (MDPI), 2019**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper

Human Gait Symmetry Assessment using a Depth Camera and Mirrors — **CBM (Elsevier), 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | arXiv

3D Reconstruction With Time-of-Flight Depth Camera and Multiple Mirrors — **IEEE Access (IEEE), 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | dataset

Matching-based Depth Camera and Mirrors for 3D Reconstruction — **SPIE 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | arXiv

Assessment of Gait Normality using a Depth Camera and Mirrors — **BHI 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | arXiv

Skeleton-based Gait Index Estimation with LSTMs — **ICIS 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | arXiv | GitHub

Estimating Skeleton-Based Gait Abnormality Index by Sparse Deep Auto-Encoder — **ICCE 2018**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | arXiv | GitHub

Skeleton-based Abnormal Gait Detection — **Sensors (MDPI), 2016**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper | GitHub

Geometry-based Static Hand Gesture Recognition using Support Vector Machine — **ICARCV 2014**
Trong-Nguyen Nguyen, Duc-Hoang Vo, Huu-Hung Huynh and Jean Meunier — paper

Extracting Silhouette-based Characteristics for Human Gait Analysis using One Camera — **SoICT 2014**
Trong-Nguyen Nguyen, Huu-Hung Huynh and Jean Meunier — paper