

# Tran Hoang Loc

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## OBJECTIVE

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- Seeking full time position in teaching and technical field to improve my technical and communication skills.

## QUALIFICATIONS

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- Demonstrated ability to work independently or cooperatively as part of a team to meet project deadlines.
- Develop teaching and technical plans.

## TECHNICAL EXPERTISE

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- Programming Languages: C, C++, assembly language for Intel-based computers, PLCs, high performance computing using C and FORTRAN, PHP, MapReduce.
- Softwares: Matlab, R, Python, Microsoft Offices.
- Operating System: Unix and Windows.

## WORKING EXPERIENCE

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<b>Tenpoint7, Ho Chi Minh City, Vietnam</b> Senior Data Scientist	12/2021-now
<b>TP&amp;P, Ho Chi Minh City, Vietnam</b> Senior Data Scientist	6/2021-9/2021
<b>CREATORY, Ho Chi Minh City, Vietnam</b> Senior Data Mining Engineer	8/2020-6/2021
<b>John von Neumann Institute (VNU-HCM), Ho Chi Minh City, Vietnam</b> Research Assistant	3/2017-now
<b>University of New Brunswick, Canada</b> Research Assistant	5/2016-2/2017
<b>University of Technology Ho Chi Minh City, Vietnam</b> Research Assistant	2/2014-2/2016
<b>EMN Company, Vietnam</b> Software Developer	9/2008-12/2013
<b>University of Minnesota, Minneapolis, MN, USA</b> Graduate teaching assistant Mathematics	2003-2007
• Grading papers and helping students solve their homework: number theory, college algebra, pre-calculus	

Lab Attendant

## EDUCATION

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- 2003 Bachelor of Computer Science at **University of Minnesota; Institute Of Technology. Minneapolis, MN, USA** (GPA: 3.85/4.00 (distinction))
- 2012 Master of Science of Computer Science at **University of Minnesota; Institute Of Technology. Minneapolis, MN, USA** (GPA: 3.66/4.00)
- Defended March 25th, 2023 PhD of Computer Science at **École Pratique des Hautes Études - PSL Research University, Paris, France**

## FOREIGN LANGUAGES

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- Fluent in English, Vietnamese.

## WORKING STATUS

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- Vietnamese Citizen.

## PUBLICATIONS

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### Journals

Loc Tran: Application of three graph Laplacian based semi-supervised learning methods to protein function prediction problem. *International Journal of Bioinformatics & Biosciences* (2013)

Loc Tran, Linh Tran: Hypergraph and protein function prediction with gene expression data. *Journal of Automation and Control Engineering* (2014) – EI indexing

Loc Tran, Linh Tran: Un-normalized graph p-Laplacian semi-supervised learning method applied to cancer classification problem. *Journal of Automation and Control Engineering* (2014) – EI indexing

Loc Hoang Tran, Linh Hoang Tran, Hoang Trang, and Le Trung Hieu, "Combinatorial and Random Walk Hypergraph Laplacian Eigenmaps," *International Journal of Machine Learning and Computing* vol.5, no. 6, pp. 462-466, 2015.

Le Trung Hieu, Hoang Trang, Loc Hoang Tran, and Linh Hoang Tran, "Disease Gene Prioritization and the Novel Un-normalized Graph (p-) Laplacian Ranking Methods," *International Journal of Machine Learning and Computing* vol.6, no. 1, pp. 71-75, 2016.

Tran, Loc, and Linh Tran. "The Un-normalized Graph p-Laplacian based Semi-supervised Learning Method and Speech Recognition Problem." *International Journal of Advances in Soft Computing & Its Applications* 9.1 (2017) – Scopus indexing

Tran, Loc Hoang, and Linh Hoang Tran. "Applications of (SPARSE)-PCA and LAPLACIAN EIGENMAPS to Biological Network Inference Problem using Gene Expression Data." *International Journal of Advances in Soft Computing & Its Applications* 9.2 (2017) – Scopus indexing

Tran, Loc Hoang, and Linh Hoang Tran. "The combination of Sparse Principle Component Analysis and Kernel Ridge Regression methods applied to speech recognition problem." *International Journal of Advances in Soft Computing & Its Applications* 10.2 (2018) – Scopus indexing

Linh Tran, Loc Tran, An Mai, Tho Quan, "Weighted un-normalized hypergraph Laplacian eigen maps

for classification problem”, International Journal of Advances in Soft Computing and Its Applications (IJASCA), 10(3), 2018 – Scopus indexing

Loc Tran, Tho Quan, An Mai, “PageRank algorithm for Directed Hypergraph”, Journal of Informatics and Mathematical Sciences, 2018 – ESCI indexing (ISI)

Tran, Loc Hoang, and Linh Hoang Tran. ”Un-normalized hypergraph p-Laplacian based semi-supervised learning methods.” arXiv preprint arXiv:1811.02986 (2018) – Scopus indexing

Tran, Loc, et al. ”Tensor sparse PCA and face recognition: a novel approach.” SN Applied Sciences 2.7 (2020): 1-7 – ESCI indexing (ISI)

Dang, Nguyen Trinh Vu, Loc Tran, and Linh Tran. ”Noise-robust classification with hypergraph neural network.” arXiv preprint arXiv:2102.01934 (2021) – Scopus indexing

Tran, Loc Hoang, and Linh Hoang Tran. ”Directed hypergraph neural network.” arXiv preprint arXiv:2008.03620 (2020). – Scopus indexing

Tran, Loc H., Nguyen Trinh, and Linh H. Tran. ”Hypergraph convolutional neural network-based clustering technique.” arXiv preprint arXiv:2209.01391 (2022).

## Conferences

Loc Tran: The un-normalized graph p-Laplacian based semi-supervised learning method and protein function prediction problem. The Fifth International Conference on Knowledge Systems and Engineer (2013) – Springer conference

Loc Tran, Linh Tran: Hypergraph and protein function prediction with gene expression data. The Second International Conference on Intelligent and Automation Systems (2014)

Loc Tran, Linh Tran: Un-normalized graph p-Laplacian semi-supervised learning method applied to cancer classification problem. The Second International Conference on Intelligent and Automation Systems (2014)

Loc Hoang Tran, Linh Hoang Tran, Hoang Trang: Novel ranking method applied to complex membership determination problem. The 13th international conference on Computer Information Systems and Industrial Management Applications (2014) – LNCS Springer (ISI Proceedings)

Hoang Trang, Loc Tran: Kernel Ridge Regression method applied to speech recognition problem: a novel approach. The 2014 International Conference on Advanced Technologies for Communications – IEEE conference

Hoang Trang, Loc Tran: Proposed combination of PCA and MFCC feature extraction in speech recognition system. The 2014 International Conference on Advanced Technologies for Communications – IEEE conference

Loc Tran, Linh Tran, Hoang Trang: Un-normalized and random walk hypergraph Laplacian un-supervised learning. International Conference on Nature of Computation and Communication 2014 – LNICST Springer (ISI Proceedings)

Loc Tran, Hoang Trang: Graph based semi-supervised learning method applied to speech recognition problem. International Conference on Nature of Computation and Communication 2014 – LNICST Springer (ISI Proceedings)

HYPERGRAPH BASED SEMI-SUPERVISED LEARNING ALGORITHMS APPLIED TO SPEECH RECOGNITION PROBLEM: A NOVEL APPROACH. International Conference on Advanced Computing and Applications 2014

Combinatorial and random walk hypergraph Laplacian Eigenmaps. The Third International Conference on Intelligent and Automation Systems (2015)

Disease Gene Prioritization and the novel un-normalized graph (p-) Laplacian ranking methods. The Third International Conference on Intelligent and Automation Systems (2015)

APPLICATIONS OF PCA AND LAPLACIAN EIGENMAPS TO BIOLOGICAL NETWORK INFERENCE PROBLEM USING GENE EXPRESSION DATA. The 2015 International Symposium on Electrical and Electronics Engineering (ISEE 2015)

The combination of Principle Component Analysis and Kernel Ridge Regression methods applied to speech recognition problem: A Novel Approach. The 2015 International Symposium on Electrical and Electronics Engineering (ISEE 2015)

Cha, Sangwhan, et al. "The role of an IoT platform in the design of real-time recommender systems." Internet of Things (WF-IoT), 2016 IEEE 3rd World Forum on. IEEE, 2016.

Mai, An, et al. "VGG deep neural network compression via SVD and CUR decomposition techniques." 2020 7th NAFOSTED Conference on Information and Computer Science (NICS). IEEE, 2020.

Tran, Loc, et al. "On a development of sparse PCA method for face recognition problem." 2021 International Conference on Advanced Technologies for Communications (ATC). IEEE, 2021.

Tran, Loc, et al. "Text classification problems via BERT embedding method and graph convolutional neural network." 2021 International Conference on Advanced Technologies for Communications (ATC). IEEE, 2021.

## RESEARCH AND TEACHING INTERESTS

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Data mining, Machine Learning, Bioinformatics, Spectral (hyper)-graph theory, Semi-supervised learning

## COURSE PROJECTS

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- LU Factorization and OpenMP
- PCA and face recognition
- Linear Systems and PageRank
- Novel Methods for Protein Function Classification from Multiple Sources
- Compiler Design

## WORK PROJECTS

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- University of Technology Ho Chi Minh City: Speech recognition: Feature Extraction, HMM training, (Hyper)- graph based semi-supervised learning method (i.e. classification tasks). I have been working on this project for almost two years. My main task at the university is
  - to implement feature extraction part (i.e. to get the MFCC matrices for every utterances) in Matlab
  - to implement the HMM training process
  - to apply the PCA and sparse PCA method to the MFCC matrices and then apply any machine learning technique to these MFCC data
  - to apply (hyper)-graph based semi-supervised learning method to speech recognition project
  - to write international journals and international conferences' papers relating to speech recognition project (see publications section)

- EMN Project: Face Recognition: PCA based face recognition system, Tensor sparse PCA based face recognition system. This project is part of the biometric security system. The code of this project is implemented in Matlab and C. This task is also the classification task given a set of training images and testing images. In this project, I learn sparse optimization technique (i.e. ADMM method). This technique is quite new and has not been investigated up to now, to the best of my knowledge. Right now, I try to apply the Alternating Direction Method of Multipliers (i.e., ADMM method) to graph p-Laplacian clustering technique.
- EMN Project: Stock trend prediction: (Hyper)-graph based semi-supervised learning method (by using Matlab and C). I also implement the code in Python. This task is the time series data mining task. After retrieving the feature vector from the time series stock data, we can apply any machine learning technique (i.e., classification technique) to the transformed data to get the trend information of the stock data (i.e., going up or going down). For future work, we can implement the parallel version of the code.
- EMN Project: Circuit partitioning: Spectral clustering (i.e., clustering tasks) (by using Matlab and C). Then implement their parallel version of the code using C and MPI. I also implement the code in Python. The circuit is considered as the network with nodes and edges (i.e., connection between nodes). Currently, I'm thinking about consider the circuit as the hypergraph.
- John Von Neumann - VNG Project (6 months): Fraud Detection: Un-supervised learning methods such as k- mean, k-NN, LOF are used to detect fraud transactions in big dataset.
- John Von Neumann-Inspectorio Project (1 year): Natural Language Processing project:
  - Check similarity among customer's address information
  - Questioning-Answering system
- CREATORY (11 months): Natural Language Understanding project:
  - Knowledge Graph: Questioning-Answering system, Factual Checking System, etc. (Neo4j, Cypher)
  - Text Classification (sentiment/intent/genre classification)
  - Text Clustering
- TP&P (4 months): Natural Language Processing project
  - Aspect based sentiment analysis
- Tenpoint7-Capital One Project (more than 1.5 year): Natural Language Processing project:
  - Knowledge Graph (Gremlin, AWS Neptune)
  - Prompt Engineering (ChatGPT)

## REFERENCES

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- Marc Bui: Professor of EPHE-PSL:  
✉ [marc.bui@ephe.psl.eu](mailto:marc.bui@ephe.psl.eu)
- Linh Tran: Lecturer of Ho Chi Minh City University of Technology:  
✉ [linhtran@hcmut.edu.vn](mailto:linhtran@hcmut.edu.vn)
- Thien Truong NGUYEN LY: Lecturer of Ho Chi Minh City University of Technology:  
✉ [truongnguyen@hcmut.edu.vn](mailto:truongnguyen@hcmut.edu.vn)

Ho Chi Minh City, Vietnam

Dear officers,

I learned that you need a position in Data Science field. I am very interested in this position and believe that my education and employment background are appropriate for the position.

- Bachelor Degree in Computer Science at the University of Minnesota
- Master Degree in Computer Science (Bioinformatics emphasis) at the University of Minnesota
- Can design and develop numerous testing strategies such as cross-validation and leave-one-out
- Boost performance some basic linear iterative techniques such as Jacobi, Gauss-Seidel, and SOR by improving the performance of sparse matrix-vector multiplication using two storage CSR and CSC scheme
- Implement numerous semi-supervised graph-based learning methods and develop the discrete regularization framework for these methods using Matlab (can implement and boost the performance of these codes in C and C++)
- Familiar with the linear algebra and data exploration theory, statistics, probability
- Familiar with data mining: dimensional reduction techniques (i.e. PCA, NMF, LLE, Laplacian Eigenmaps) and clustering techniques (i.e. k-mean, hierarchical clustering, SOM, spectral clustering). Possible Extension: Apply tensor decomposition to dimensional reduction techniques and clustering techniques such as Multi-linear PCA, multi-linear spectral clustering.
- Familiar with machine learning: classification (ANN, SVM, (hyper-) graph-based semi-supervised learning, graph (p-) Laplacian based semi-supervised learning)
- Interested in learning MapReduce and Python. I have studied MapReduce and Python with some independent project: WordCount, PageRank
- Have great skills in solving algebra, pre-calculus, calculus problems
- Proficient in Windows and Unix OS
- Work well with teams
- Always on active on tasks, reliable, friendly
- Implement login system, shopping cart system using PHP and mySQL
- Fluent in English
- Fluent in Microsoft Offices

Enclosed is a copy of my resume containing my qualifications for this position.

I look forward to talk with you regarding this position.

Thank you for your consideration. Sincerely,

Loc Tran

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