Linh T. Duong

Personal Information

Name:	Linh DUONG
ORCID:	0000-0001-7411-1369
Google Scholar:	https://bit.ly/37pncAK
ResearchGate:	https://www.researchgate.net/profile/Linh-Duong-Tuan
GitHub:	https://github.com/linhduongtuan
Gender:	Male
Place and Date of Birth:	Hanoi, Vietnam | 27 February 1982
Address:	Cellovägen 7, 19637 Kungsängen, Stockholm, Sweden
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Nationality:	Vietnamese

Profile

I have been a researcher at the Department of Applied Physics, KTH Royal Institute of Technology. My research interests lie in understanding bacterial virulence factors, physiology, and how they interact with cellular signaling pathways. I also leverage computational biology to investigate the genes and lifestyles associated with non-communicable diseases. Additionally, I hold a strong passion for applying machine learning and computer vision to analyze biomedical signals.

Education

11/2014	Doctorate degree, Dr. rer. nat.
	University of Greifswald, Germany
09/200–11/2014	PhD student at the University of Greifswald, Germany
Thesis title	Characterization of putative virulence-associated genes of *Burkholderia pseudomallei*
Link	https://epub.ub.uni-greifswald.de/files/1450/diss_Linh_Duong_Tuan_.pdf
12/2009	Master of Science in Microbiology
	Vietnam National University, Hanoi, Vietnam
09/2006–12/2009	Studies of Microbiology at Vietnam National University, Hanoi, Vietnam
Thesis title	Study some epidemiological characters of scrub typhus *Rickettsia (Orientia) tsutsugamushi* isolated in Khanh Hoa province
6/2008	German Diploma Equivalence
06/2007 – 07/2008	studied in the Joint Graduate Education Program cooperated among University of Greifswald, Germany; Vietnam National University, Hanoi, Vietnam; And Institute of Biotechnology, Vietnam Academy of Science and Technology.
7/2004	Bachelor of Science in Biology
	Vietnam National University, Hanoi, Vietnam
9/2000–7/2004	Studies of Microbiology at University of Science, Hanoi, Vietnam
Thesis title	Characterization of some biochemical immunology of *Aeromonas hydrophila* and usage to vaccine trial

Major Research Topics of Interest

- **Molecular and Cell Biology;**
- **Computational Biology;**
- **Medical Imaging Recognition using Deep Learning;**
- **Medical Microbiology;**
- **Human Genetics;**
- **Epidemiology.**

Work Experience

11/2023 - present: Researcher at the KTH Royal Institute of Technology, School of Engineering Sciences, Department of Applied Physics, located at: Tomtebodavägen 23A, 17165 Solna, Sweden:

- **Researcher**: Emphasize the significance of Molecular and Cell Biology research in generating reliable data;
- **Researcher**: Harness the power of cutting-edge Artificial Intelligence to revolutionize Computational Biology.

2019 – 8/2023: Visiting Researcher at Institute of Research and Development - Duy Tan University - Vietnam:

- **Principal investigator**: Apply deep learning for medical imaging recognition tasks which focus on classification of Lungs images related to certain diseases such as **SARS-CoV-2** and **Tuberculosis**;
- **Principal investigator**: carry artificial intelligence out agriculture such as fruits and vegetables classification, and plant diseases recognition;
- **Participant** in Project: to deploy research results into mobile application and hospital computer-aid systems;
- **Participant** in Project: evaluate follow-up research of computer-aid tools for Lungs detection diseases in hospitals.

2015 – present: Researcher at Department of Nutrition for Noncommunicable Diseases - National Institute of Nutrition – Vietnam Ministry of Health:

- **Principal investigator**: "Deep learning for classification of some bacteria species using bacterial morphology colony and Gram-staining images" funded by Vietnam Ministry of Health, 2019;
- **Principal investigator**: "Characterization of genes-associated virulent factors of some bacteria species isolated from meats sold in markets and supermarkets in Hanoi, 2018" funded by Vietnam Ministry of Health;
- **Co-principal investigator**: "Automated Recognition of BI-RADS scores from Mammograms collecting from Vietnamese women" sponsored by Hanoi Oncology Hospital, Vietnam Ministry of Health;
- **Participant**: "Primarily Study Gut Micriobiome of Type 2 Diabetes Mellitus Patients Living in Hanoi, Vietnam" funded by Vietnam Ministry of Health, 2020;
- **Participant**: "A 5-year prospective study on type 2 diabetes and metabolic syndrome in Vietnamese: role of genetic and lifestyle-related factors" sponsored by National Foundation for Science Technology Development, Vietnam Ministry of Science and Technology;
- **Participant**: "Surveillance of viral hepatitis infections in multi-geographic regions in Vietnam" granted by Vietnam-Russia Tropical Centers, Vietnam Ministry of Health;
- **Participant**: "Surveillance of *Orientia tsutsugamushi* infections in multi-geographic regions in Vietnam, and isolation of antigenic membrane 56 kDa for production of ELISA kit" granted by Vietnam Ministry of Health;
- **Topics of interest**: emerging and reemerging infectious diseases like diarrhea, meningitidis; zoonotic diseases such as Dengue virus, Influenza virus, *Rickettsia* spp., MERS-CoV, SARS-CoV-1, SARS-CoV-2; environmental niches of microorganism pathogens; virulence factors; microbiome; host-pathogen interaction; bioinformatics; human genetics and lifestyle related to non-communicable diseases; machine learning; and Deep Learning for medical image recognition.

2010 – 2014: PhD student at Friedrich Loeffler Institute of Medical Microbiology, Greifswald University Hospital, University of Greifswald, Germany :

- Research on virulence factors, host-pathogen interaction, bacterial physiology, and multi-omics of *Burkholderia pseudomallei*.

Teaching and Supervising

- Currently, co-supervisor for one PhD student for Nutrition; scientific advisor for one medical PhD students, investigating human genetics associated with metabolism disorder syndromes; and scientific advisor for one pharmacy PhD student, studying HLA variants related to use drugs and serious allergy;
- Scientific advisor for one master student in medical microbiology;
- Scientific supervisor for four master students in pharmacy;
- Scientific supervisor for one bachelor student in life science;
- Lecturer for many advanced nursery classes in medical microbiology;
- Lecturer for and train for biosafety and biosecurity;
- Lecturer for microbiome/microbiota topic for PhD students in nutrition disciplines;
- Visiting lecturer at Hanoi University of Pharmacy;
- Presenter of scientific seminars on various topics such as: medical microbiology, human genetics, bioinformatics, bio-statistics, machine learning, deep learning.

Reviewer

- Artificial Intelligence Review Journal, **4-year Impact Factor = 11.674**;
- Expert Systems with Applications Journal, **4-year Impact Factor = 9.602**;
- Computers and Electronics in Agriculture Journal, **4-year Impact Factor = 8.045**;
- Precision Agriculture Journal, **4-year Impact Factor = 6.539**

Programming and relevant skills

- Basic knowledge of the Linux operating system;
- Knowledge of Probability and Statistics, Calculus, Linear Algebra, and Algorithms;
- Skills in object-oriented languages like R and Python;
- Basic skills in Julia and MATLAB languages;
- Start learning general-purpose programming language C++, Rust;
- Good experience with Deep Learning frameworks including TensorFlow, PyTorch, and JAX;
- Good knowledge of Tidyverse packages in R, and pandas, matplotlib, and Scikit-learn in Python;
- Familiar with certain codebases such as the HuggingFace ecosystem (e.g., Transformers, datasets, accelerate, etc.), PyTorch Image Models, OpenMMLab ecosystem (e.g., MMClassification, MMDetection, MMSegmentation, etc.);
- Skills with LaTeX;
- Experience on medical imaging recognition and Biomedical signalling analysis (such as ElectroCardioGram and ElectroEncephaloGram) using Deep Learning, especially Graph Neural Networks.

Scientific Profiles

- Web of Science: https://www.webofscience.com/wos/author/record/CAH-0162-2022;
- Google Scholar: https://bit.ly/37pncAK;
- ResearchGate: https://www.researchgate.net/profile/Linh_Duong_Tuan;
- ORCID: https://orcid.org/0000-0001-7411-1369;

- GitHub: https://github.com/linhduongtuan;

Publications

Journal papers

- **Linh T Duong**, Toan B Tran, Nhi H Le, Vuong M Ngo, Phuong T Nguyen. Automatic detection of weeds: synergy between EfficientNet and transfer learning to enhance the prediction accuracy. *Soft Computing 28, 5029–5044 (2024)*. DOI: https://doi.org/10.1007/s00500-023-09212-7. **4-year Impact Factor = 4.534. My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Thu T.H. Doan, Cong Q. Chu, Phuong T. Nguyen. Fusion of edge detection and graph neural networks to classifying electrocardiogram signals. *Elsevier Expert Systems with Applications*, DOI: https://doi.org/10.1016/j.eswa.2023.120107. **4-year Impact Factor = 9.602. My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Cong Q. Chu, Phuong T. Nguyen, Son T. Nguyen, Binh Q. Tran. Edge Detection and Graph Neural Networks to Classify Mammograms: A Case Study with Datasets from Vietnamese Patients, *Elsevier Applied Soft Computing*, DOI: https://doi.org/10.1016/j.asoc.2022.109974, **4-year Impact Factor = 9.028. My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Phuong T. Nguyen, Ludovico Iovino, and Michele Flammini. Automatic Detection of Covid-19 from Chest X-ray and Lung Computed Tomography Images using Deep Neural Networks and Transfer Learning, *Elsevier Applied Soft Computing*, https://doi.org/10.1016/j.asoc.2022.109851, **4-year Impact Factor = 9.028 . My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Nhi H. Le, Toan B. Tran, Vuong M. Ngo, and Phuong T. Nguyen. Detection of Tuberculosis from Chest X-ray Images: Boosting the Performance with Vision Transformer and Transfer Learning. *Elsevier Expert Systems with Applications*, DOI: https://doi.org/10.1016/j.eswa.2021.115519, **4-year Impact Factor = 9.602. My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Phuong T. Nguyen, Claudio Di Sipio, and Davide Di Ruscio, Automated Fruits Recognition on using EfficientNet and MixNet, *Elsevier Computers and Electronics in Agriculture*, Volume 171, April 2020, 105326, DOI: https://doi.org/10.1016/j.compag.2020.105326, **4-year Impact Factor = 8.045. My contributions to the paper include Conceptualization, Methodology, Software, Writing – Original Draft, and Writing – Review and Editing.**
- **Linh T. Duong**, Sandra Schwarz, Harald Gross, Katrin Breitbach, Falko Hochgräfe, Jörg Mostertz, Kristin Eske-Pogodda, Gabriel E. Wagner, Ivo Steinmetz, and Christian Kohler, GvmR - a novel LysR-type Transcriptional Regulator Involved in Virulence and Primary and Secondary Metabolism of *Burkholderia pseudomallei*. *Frontiers in Microbiology*, DOI:10.3389/fmicb.2018.00935, **4-year Impact Factor = 6.376. My contributions to the paper include Conceptualization, Study Design and Execution of the Experiments, and Data Analysis.**
- Tran Quang Binh, **Linh T. Duong**, Le Thi Kim Chung, Pham Tran Phuong, Bui Thi Thuy Nga, Nguyen Anh Ngoc, Tran Quang Thuyen, Do Dinh Tung, and Bui Thi Nhung. FTO-rs9939609 Polymorphism is a Predictor of Future Type 2 Diabetes: A Population-Based Prospective Study. *Biochemical Genetic Journal*, DOI: https://doi.org/10.1007/s10528-021-10124-0, **4-year Impact Factor = 2.176. My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Tran Quang Binh, Pham Tran Phuong, Chung Thanh Nguyen, Nhung Thi Bui, Tung Dinh Do, Tran Quang Thuyen, **Linh T. Duong**, Bui Thi Thuy Nga, and Nguyen Anh Ngoc. High incidence of type 2 diabetes in a population with normal range body mass index and individual prediction nomogram. *Diabetic Medicine*, DOI: https://doi.org/10.1111/dme.14680, **4-year Impact Factor = 3.252** . **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Tran Quang Binh, Pham Tran Phuong, Nguyen Thanh Chung, Bui Thi Nhung, Do Dinh Tung, **Duong T. Linh**, Tran Ngoc Luong, Le Danh Tuyen. A simple nomogram for identifying individuals at high risk of undiagnosed diabetes in rural population. *Diabetes Research and Clinical Practice*, DOI: https://doi.org/10.1016/j.diabres.2021.109061, **4-year Impact Factor = 6.854**. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Tran Quang Thuyen, Dinh Hong Duong, Bui Thi Thuy Nga, Nguyen Anh Ngoc, **Linh T. Duong**, Pham Tran Phuong, Bui Thi Nhung, Tran Quang Binh. Incidence and prediction nomogram for metabolic syndrome in a middle-aged Vietnamese population: a 5-year follow-up study. *Endocrine*, DOI: https://doi.org/10.1007/s12020-021-02836-5, **4-year Impact Factor = 2.769** . **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Binh Quang Tran, Phuong Tran Pham, Chung Thanh Nguyen, Nhung Thi Bui, Tung Dinh Do, Thuyen Quang Tran, **Linh T. Duong**, Nga Thi Thuy Bui, Ngoc Thi Anh Nguyen, and Tuyen Danh Le. First Report on Association of Hyperuricemia with Type 2 Diabetes in a Vietnamese Population. *International Journal of Endocrinology*, DOI: https://doi.org/10.1155/2019/5275071, **4-year Impact Factor = 2.633**. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- **Linh T. Duong**, Nhung Kim Thi Pham, and Tuyen Trong Doan. 17 Sequences of Two Genes Encoded *groEL* and *56kDa* Antigens of *Orientia tsutsugamushi*. published at www.ncbi.nlm.nih.gov (accession numbers: from GUI128872 to GU128880 and from GU903935 to GU903942). **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- **Linh T. Duong**, and Thang Chien Vu. Comparison of Height, and Body Mass Index between Age groups 16 – 22 and 36 – 42 according to Ethnic groups Living in Vietnam, 2012 – 2013. Vietnam Journal of Preventive Medicine., Collection number 28, number 4 – 2018

- **Linh T. Duong**. *Burkholderia psedomallei* and Melioidosis. Vietnam Journal of Preventive Medicine, Collection number 27, number 1 (189) – 2017. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- **Linh T. Duong**, and Cuong Viet Vo. *Orientia tsutusgamushi*: Some Characters of Epidemiology, Bacteriology, Clinical Syndromes, and Treatment. Vietnam Journal of Preventice Medicine, Collection number 27, number 13 – 2017. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Minh Van Nguyen, Tinh Van Nguyen, Giang Thi Ha Pham, Toan Van Trinh, **Linh T. Duong**, and Cuong Viet Vo. Genetic Characterization of *Orientia tsutsugamushi* Isolation in some Northern Provinces of Vietnam. Vietnam Journal of Tropical Technology, number 13, October 2017. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- **Linh T. Duong**, Anh Thi Lan Bui, Quang Ngoc Pham, Tuyen Trong Doan, A.V Dmitriev, and O.V. Kalinina. Prevalence and Genotypes of Hepatitis B Circulating in sime Provinces, Vietnam, 2012 – 2013. Vietnam Journal of Tropical Technology, number 13, October 2017. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

- Anh Thi Lan Bui, Nam Thanh Ngo, **Linh T. Duong**, Shpak Ivan Mikhailovic, and Zakhorova Irina Borisova. Detection and Identification of *Burkholderia* spp. Isolated from Soils in Nghe An Province, Vietnam. Vietnam Journal of Tropical Technology, number 13, October 2017. **My contributions to the paper include Conceptualization, Study Design, Data Collection, Data Analysis, Discussion, and Editing of the final draft for publication.**

Manuscripts under review/revision

- **Linh T. Duong**, Thu T. H. Doan, Cong Q. Chu, Phuong T. Nguyen. Automated Recognition of Breast Cancer from Heterogeneous Sources of Breast Ultrasound Databases. Submitted to *Elsevier Expert Systems with Applications*, **4-year Impact Factor = 9.602**
- **Linh T. Duong**, Thu T. H. Doan, Cong Q. Chu, Binh Q. Tran, Thuyen Q. Tran, Phuong T. Nguyen. Detection of Microorganisms based on Morphology Colonies Growth on a Solid environment. Submitted to *Elsevier Expert Systems with Applications*, **4-year Impact Factor = 9.602**
- **Linh T. Duong**, Cong Chu, Son Nguyen, Binh Q. Tran, Phuong T. Nguyen. Automatic Detection of Weeds: Synergy between EfficientNet and Transfer Learning to Enhance the Prediction Accuracy. Submitted to *Springer Soft Computing*, under review after the first round of revision, **4-year Impact Factor = 4.203**
- **Linh T. Duong**, Cong Q. Chu, Son T. Nguyen, Binh Q. Tran, Phuong T. Nguyen. Effective Detection of Breast Cancer from X-ray Images with EfficientNet and Transfer Learning. Submitted to *Springer Soft Computing*, under review, **4-year Impact Factor = 4.203**

Preprints

- **Linh T. Duong**, Phuong T. Nguyen, Ludovico Iovino, and Michele Flammini. Deep Learning for Automated Recognition of Covid-19 from Chest X-ray Images. *MedRxiv preprint* doi:https://doi.org/10.1101/2020.08.13.20173997.
- **Linh T. Duong**, Cong Q. Chu, Son T. Nguyen, Binh Q. Tran, Phuong T. Nguyen. Effective Detection of Breast Cancer from X-ray Images with EfficientNet and Transfer Learning. Available at SSRN 4043666.

Manuscripts under preparation

- **Linh T. Duong**, Binh Quang Tran, Huy Hoang Nguyen, Thuyen Quang Tran, Vuong M. Ngo, and Phuong T. Nguyen, Graph Neural Networks for Automated Classification of Seizures from ElectroEncephaloGrams, Manuscript
- **Linh T. Duong**, Nhi H. Le, Toan B. Tran, Vuong M. Ngo, and Phuong T. Nguyen. Deep Learning for Automated Recognition of Bacterial and Viral Pneumonia from Chest X-ray Images. Manuscript
- **Linh T. Duong**, Binh Quang Tran, Huy Hoang Nguyen, Thuyen Quang Tran, Phuong T. Nguyen. Application of Deep Learning to Classification of Bacterial Colony Morphology and Gram-stained Images. Manuscript
- **Linh T. Duong**, Anh Thi Lan Bui, Cuong Viet Vo, Dung Phu Nguyen, Tuyen Trong Doan, Thang Chien Vu, Nga Thi Thuy Bui, Quang Ngoc Pham, A.V. Dmitriev, O. Kalinina, and Binh Quang Tran. High Prevalence and Genetic Diversity of Hepatitis B Virus Circulating in Multi Demographical Regions of Vietnam, 2012 – 2013. Manuscript

Posters and Conference papers

- Poster: Molecular Epidemiology of Hepatitis B virus in Vietnam, From Basic Science to Biomarkers and tools in Global Health, Institute Pasteur International Network, Scientific Symposium, Paris November 29th - October 2nd, 2016, France;

- Poster: High Prevalence of Hepatitis B Virus among the Adults Living in Three Regions of Vietnam, European Society of Clinical Microbiology and Infection Diseases, Conference 26th in Netherlands;
- The 65th Joint Annual Meeting of the German Society for Hygiene and Microbiology and the German Society for Infectious Diseases, Rostock, Germany, 2013.

References

- Dr. Wei Ouyang
  Tenure-track Assistant Professor
  Department of Applied Physics
  School of Engineering Sciences
  KTH Royal Institute of Technology
  Address: Tomtebodavägen 23A, 17165 Solna, Sweden
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- Dr.-Ing. Phuong T. Nguyen
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- Prof. Dr. MD. Ivo Steinmetz
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Honours and Awards

- Scholarship for conducting the PhD study in Germany;
- The best presentation at Conference organized by National Institute of Nutrition in 2019.

Miscellany

- **Languages**: Vietnamese (native), English (fluent), German (good), and Organize my time to learn Swedish;
- **Soft skills**: posters and presentations, time management, leadership; teamwork, adaptability;
- **Hobbies**: playing various sports, reading, documentary films, history, and philosophy.