

# Huy Quang Duong

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Department of Computer Science  
Norwegian University of Science and Technology  
Gløshaugen, Trondheim, Norway  
Homepage: <https://thi3n10ng.github.io/>

Phone: (+47) 9842-0887  
Email: [huydqyb@gmail.com](mailto:huydqyb@gmail.com)  
Source Repo: <https://bitbucket.org/duonghuy/>  
Nationality: Vietnamese (Permanent residence in Norway)

## Summary

I have 10-year experience in working in industry and 4.5 years doing research in academia. I have background in Computer Science, and I am good at Mathematics and at Programming.

## Education

Ph.D. in Computer Science, NTNU, Norway (ongoing defense)	Mar 2017 - Jun 2020
M.Sc. in Computer Science, Hunan University, China	Sep 2014 - Nov 2016
B.S. in Computer Science, Hanoi University of Technology, Vietnam	Sep 1999 - Jun 2004

## Work Experience

### 2017 – Present

### Research Fellow, NTNU, Norway

– I am a member of Data and Artificial Intelligence group, and working in the MUSED (Multi-Source Event Detection) project at NTNU. The project handles big data streams in a wide-range of applications, e.g. classification, change detection, fraud detection, network attack, and genetics applications. I developed novel techniques and efficient algorithms for detecting events in various type of data. The short outcome of my work is summarized as follows:

- Project 1. Optimize the memory usage, and propose a novel structure to avoid costly joins in mining high profit product groups. The method is **6 times lesser memory consumption**, and **10 times faster** than the state-of-the-art methods.
- Project 2. Analyze the user activity behavior in social networks. I propose an evolving model to quickly adapt with the changes in user behaviors, which is more accurate in classification. The proposed method is 3.99% more accurate in classification task, and the error rate is **12 times better** than the existing methods (ACM CIKM 2019, Rank A).
- Project 3. Develop theoretical proofs for multiple dense subtensor detection with guarantee on the density. Propose a new technique to detect **multiple dense subtensors** with a higher lower bound density guarantee. The method is **two million times more accurate** on density and **6.9 times faster** (IEEE ICDE 2020, Rank A\*).

– Programming Languages: Java, C++, MatLab, Python.

### 2014 – 2016

### CSC Master in Computer Science, Hunan University, China

– Score 91.94/100, excellent. Taken courses are Algorithm Analysis and Design, Discrete Mathematics, Intelligent Optimization Algorithm, Advanced Artificial Intelligence, Program Language, Advanced Computer Organization, Advanced Data structure and Algorithm.

- Proposed a method for quickly raising the lower bound value to prune the search space in mining top-k high utility itemsets. Our method outperforms the state-of-the-art methods (*Knowledge-Based System*).

## Industry Working Experience

**2013 – 2014**

**Senior Software Engineer, MB Bank, Vietnam**

- Develop enterprise applications (HR) and business processing management (BPM) (appraisal process, loan process) using software-AG product, service monitoring tool. Advising and fixing some vulnerabilities and flaws of applications and systems.
- Platform & Techniques: Web-Based Application & Services. Software-AG, SQL-Server, PHP, C#, .NET Framework.

**2011 – 2013**

**Solution Architect, Team Leader, VTCMobile, Vietnam**

- Build Back-End framework and services for applications and games on mobile platform. Analyze and design databases and develop backends, restful services, C#, SQL-Server, NoSQL-MongoDB, OAuth.

**2006 – 2011**

**Researcher, CDIT, Vietnam**

- Designed solutions and developed applications for Vietnam Post, used in all post offices: Telecommunications service management, money transfer service management, parcel and package management, auto-update application.

- Platform & Techniques: Window & Web Based Applications. VB.Net, C#, ASP.NET, SQL-Server, Oracle.

*At the same time, I held the position as outsource software engineer for Vingroup, Vietnam.*

- Built HR system, Booking online, Member Management System, Real Estate Management.
- Platform: Window & Web Based Applications, .NET Framework, C#, DevExpress, SQL-Server.

**2004 – 2006**

**Software Engineer, VCCorp, Vietnam**

- Build content management system for news and financial (stock) service system. Build indicator, candle, pattern recognition and rebuild system with new technology, C#, APS.NET, NoSQL-Redis.

## Honors and Awards

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|---|-------------|
| 1. <b>National award in Mathematics</b> for high school student                           | 1999        |
| 2. Full CSC Scholarship for Master degree   | 2014 – 2016 |
| 3. <b>Selected for Best Papers</b> of the Industrial Conference on Data Mining Conference | 2016        |
| 4. PhD Fellowship   | 2017–2021   |
| 5. SIGIR Student Travel Grant   | 2019        |

## Research Interest

Data Mining, Algorithm Analysis, Optimization, Tensor and Graph.

Machine Learning and Artificial Intelligence.

## Selected Publications

Current h-index 8, 188 citations. For more details, please see my Google Scholar: <https://scholar.google.com/>

1. Dam, T.-L., Chester, S., Nørnvåg, K. & **Duong, Quang-Huy**. *Efficiently Retrieving Top-k Recently Frequent Terms with a Time-decay Model* in *Under Submission* (2020).
2. **Duong, Quang-Huy**, Ramampiaro, H. & Nørnvåg, K. *Multiple Dense Subtensor Estimation with High Density Guarantee* in *Proceedings of the 36th IEEE ICDE* (2020), 1–12. **One of the few papers accepted directly without revision (the direct acceptance rate is about 3%).**
3. Dam, T.-L., Ramampiaro, H., Nørnvåg, K. & **Duong, Quang-Huy**. Towards efficiently mining closed high utility itemsets from incremental databases. *Knowledge-Based Systems* **165**, 13–29 (2019).
4. **Duong, Quang-Huy**, Ramampiaro, H. & Nørnvåg, K. *Sketching Streaming Histogram Elements using Multiple Weighted Factors* in *Proceedings of the 28th ACM CIKM* (2019).
5. **Duong, Quang-Huy**, Fournier-Viger, P., Ramampiaro, H., Nørnvåg, K. & Dam, T.-L. Efficient high utility itemset mining using buffered utility-lists. *Applied Intelligence* **48**, 1859–1877 (2018).
6. **Duong, Quang-Huy**, Ramampiaro, H. & Nørnvåg, K. Applying temporal dependence to detect changes in streaming data. *Applied Intelligence* **48**, 4805–4823 (2018).
7. **Duong, Quang-Huy**, Ramampiaro, H., Nørnvåg, K., Fournier-Viger, P. & Dam, T.-L. High utility drift detection in quantitative data streams. *Knowledge-Based Systems* **157**, 34–51 (2018).
8. Dam, T.-L., Li, K., Fournier-Viger, P. & **Duong, Quang-Huy**. An efficient algorithm for mining top-k on-shelf high utility itemsets. *Knowledge and Information Systems* **52**, 621–655 (2017).
9. Dam, T.-L., Li, K., Fournier-Viger, P. & **Duong, Quang-Huy**. An efficient algorithm for mining top-rank-k frequent patterns. *Applied Intelligence* **45**, 96–111 (2016).
10. **Duong, Quang-Huy**, Liao, B., Fournier-Viger, P. & Dam, T.-L. An efficient algorithm for mining the top-k high utility itemsets, using novel threshold raising and pruning strategies. *Knowledge-Based Systems* **104**, 106–122 (2016).
11. Fournier-Viger, P., Lin, J. C.-W., **Duong, Quang-Huy** & Dam, T.-L. *PHM: mining periodic high-utility itemsets* in *Industrial conference on data mining* (2016), 64–79. **Selected for Best Papers.**

## References

Prof. Heri Ramampiaro  
Deputy Head of Department of  
Computer Science, NTNU, Norway  
Email [heri@ntnu.no](mailto:heri@ntnu.no)  
Phone +47-73591459  
+47-99027656

Prof. Philippe Fournier-Viger  
Director of Center of Innovative In-  
dustrial Design, Harbin Institute of  
Technology, China  
Email [philfv@hitsz.edu.cn](mailto:philfv@hitsz.edu.cn)  
[philfv8@yahoo.com](mailto:philfv8@yahoo.com)  
Phone +86-13699775514

Prof. Kjetil Nørnvåg  
Department of Computer Sci-  
ence, NTNU, Norway  
Email [noervaag@ntnu.no](mailto:noervaag@ntnu.no)  
Phone +47-41440433