Huy Quang Duong

Department of Computer Science
Norwegian University of Science and Technology
Gløshaugen, Trondheim, Norway
Homepage: `https://thi3nl0ng.github.io/`

Phone: (+47) 9842-0887
Email: `huydqyb@gmail.com`
Google Scholar: `https://scholar.google.com/`
Source Repo: `https://bitbucket.org/duonghuy/`

Summary

I have 10-year experience in working in industry and 6 years doing research in academia. I am good in Mathematics and in Programming.

Education

Ph.D. in Computer Science, NTNU, Norway — Mar 2017 - Jun 2020 (expected)

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

Research Fellow, NTNU, Norway   **2017 – Present**

– 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 outcome of my work is summarized as follows:

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.

2. Utilize the temporal dependence of data, and propose novel algorithms for change detection. Propose auto-tuning learning models by projecting vector on a ℓ_1 space. The method is ***the first rank*** among the compared methods.

3. Investigate the correlation between features of data in user activity behavior analysis in social networks with concept drift. Propose an evolving model that automatically updates its coefficients. The proposed method is 3.99% more accurate in classification task, and the error rate is ***12 times better*** than the state-of-the-art methods with concept drift.

4. 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***.

5. Propose novel proofs to provide a better guarantee for the dense subgraph and subtensor detection problem which have been utilized in tremendous works and applications such as fraud detection,

event detection, and genetics applications. Experiments show the efficiency of the method, it can *guarantee the density 70% more* than the state-of-the-art method.

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

CSC Master in Computer Science, Hunan University, China 2014 – 2016

– 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 novel coverage concept for quickly raising the lower bound value to prune the search space. Developed new efficient algorithm for mining top-k high utility itemsets, our proposed algorithm outperforms the state-of-the-art methods (*Knowledge-Based System, Elsevier*).

Industry Working Experience

Senior Software Engineer, MB Bank, Vietnam. 2013 – 2014

– 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-Sharp.

Solution Architect, Team Leader, VTCMobile, Vietnam. 2011 – 2013

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

Researcher, CDIT, Vietnam. 2006 – 2011

– 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-Sharp, 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, C#, DevExpress, SQL-Server.

Developer, Vinacomm, Vietnam (VCCorp). 2004 – 2006

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

Honors and Awards

1. **National award in Mathematics** for high school student — 1999
2. Full CSC Scholarship for Master degree — 2014 – 2016
3. **Selected for Best Papers** 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 Intelligent.

Selected Publications

Current h-index 7, 171 citations. For more details, please see my Google Scholar: `https://scholar.google.com/`

1. Dam, T.-L., Chester, S., Nørvåg, 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. & Nørvåg, K. *A Better Density Guarantee of Dense Subtensor and Dense Subgraph Detection* in *Under Submission* (2020).

3. **Duong, Quang-Huy**, Ramampiaro, H. & Nørvåg, 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%)**.

4. Dam, T.-L., Ramampiaro, H., Nørvåg, K. & **Duong, Quang-Huy**. Towards efficiently mining closed high utility itemsets from incremental databases. *Knowledge-Based Systems* **165,** 13–29 (2019).

5. **Duong, Quang-Huy**, Ramampiaro, H. & Nørvåg, K. *Sketching Streaming Histogram Elements using Multiple Weighted Factors* in *Proceedings of the 28th ACM CIKM* (2019).

6. **Duong, Quang-Huy**, Fournier-Viger, P., Ramampiaro, H., Nørvåg, K. & Dam, T.-L. Efficient high utility itemset mining using buffered utility-lists. *Applied Intelligence* **48,** 1859–1877 (2018).

7. **Duong, Quang-Huy**, Ramampiaro, H. & Nørvåg, K. Applying temporal dependence to detect changes in streaming data. *Applied Intelligence* **48,** 4805–4823 (2018).

8. **Duong, Quang-Huy**, Ramampiaro, H., Nørvåg, K., Fournier-Viger, P. & Dam, T.-L. High utility drift detection in quantitative data streams. *Knowledge-Based Systems* **157,** 34–51 (2018).

9. 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).

10. 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).

11. **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).

12. Fournier-Viger, P., Lin, J. C.-W., **Duong, Quang-Huy** & Dam, T.-L. *FHM + : Faster High-Utility Itemset Mining Using Length Upper-Bound Reduction* in *International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems* (2016), 115–127.

13. 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**.