

INFORMATION ON DOCTORAL THESIS

1. Full name: Nguyen Minh Tan
2. Sex: Male
3. Date of birth: 23/05/1975
4. Place of birth: Nam Dinh
5. Admission decision number: 489/QĐ-ĐT Dated 25/06/2015
6. Changes in academic process:
 - Additional instructors according to Decision No. 893/QĐ-ĐT dated 19/09/2017 of the Principal of the University of Engineering and Technology.
 - Extension of study for 02 years (from September 2018) to Decision No. 1257/QĐ-ĐT dated 13/12/2018 of the Principal of the University of Engineering and Technology.
 - Return graduate students to their working agencies (from October 1, 2020) to Decision No. 924/QĐ-ĐT dated 18/11/2020 of the Principal of the University of Engineering and Technology.
 - VNU allows grassroots protection before 30/06/2023 according to Official Dispatch No. 1501/ĐHQGHN-ĐT 28/04/2023.
7. Official thesis title: Develop complex network models and techniques for cancer data mining.
8. Major: Information system
9. Code: 9480104
10. Supervisors: Associate Professor, Dr. Nguyen Ha Nam, Dr. Tran Tien Dung.
11. Summary of the **new findings** of the thesis:
 - The purpose of the thesis is to use complex network techniques to mine data related to cancer. Using pathogenic gene ranking algorithms to predict fragile genes that can be mutated and cause disease.
 - The research object of the thesis is complex networks and parallel algorithms. KEGG datasets and K hospital cancer screening datasets.
 - The research method of the thesis is to use techniques of complex networks and parallel algorithms to analyze and mine data sets related to cancer.

- The main results of the thesis: Mining the user data set in a university's work management system, finding the system's modules, and performing K-core analysis, the distribution of order numbers, and the correlation between the system the number of clusters and the number of degrees. Mining data sets for cancer screening at K hospital. The study proposes a new technique in mining multidimensional data sets on cancer. Applying on the dataset to detect the social laws of cancer, support in the prevention and treatment of cancer. Developing parallel algorithm R-core based on the improvement of K-core algorithm to identify cancer marker genes from large-scale molecular biology networks. K-core algorithm identifies network cores based on the connectivity of network nodes, R-core algorithm identifies network cores based on the accessibility of adjacent network nodes. With this improvement, the identification of cancer marker genes becomes more accurate. Developing software to identify cancer marker genes from molecular biology network to integrate into Cytoscape software.

12. Practical applicability, if any: Applied to identify cancer marker genes from large-scale molecular biological networks.

13. Further research directions, if any: Core analysis of directed biological networks.

14. Thesis-related publications:

- Nguyễn Minh Tân, Trần Tiến Dũng (2020), “*Ứng dụng mạng phức hợp trong khai phá dữ liệu tương tác người dùng*”, Hội nghị khoa học Quốc gia Nghiên cứu cơ bản và ứng dụng Công nghệ thông tin (FAIR), trang 649-655.

- Trần Tiến Dũng, Nguyễn Minh Tân (2022), “*A network-based analysis of a workflow at Hanoi University of Industry*”, Hội nghị khoa học Quốc gia Nghiên cứu cơ bản và ứng dụng Công nghệ thông tin (FAIR), trang 171-180.

- Minh Tan Nguyen, Tien-Dzung Tran (2022), “*Network approaches for identification of human genetic disease genes*”, Vietnam J. Sci. Technol., vol. 60, no. 4, pp. 700–712, Aug. 2022.

- Minh Tan Nguyen, Duc Tinh Pham, Viet Ha Tran, and Tien-Dzung Tran (2022), “*Identification of cancer rules in Vietnam by network modularity*”, Vietnam J. Sci. Technol., vol. 60, no. 6, pp. 1134–1148, Dec. 2022 (Scopus).

- Tien-Dzung Tran, Minh Tan Nguyen (2023), “*C-Biomarker.net: A Cytoscape app for identification of cancer biomarker genes from cores of large biomolecular networks*”, BioSystems, Volume 226, April 2023, 104887 (SCIE).

Date: 11/06/2024

Signature:

Full name:

Date: 11/06/2024

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Full name: