MINISTRY OF INDUSTRY AND TRADE
ELECTRIC POWER UNIVERSITY

SOCIALIST REPUBLIC OF VIET NAM
Independent– Freedom – Happiness

SUMMARY OF NEW CONCLUSIONS OF THE DOCTORAL DISSERTATION

Name of dissertation: Improving the efficiency of drug-disease association prediction based on meta-paths and Bayesian inference on heterogeneous networks.

Major: Information Technology Code no: 9480201
Name of PhD. Student: Le Manh Hung

Advisors: **1. Dr. Dao Nam Anh**

2. Dr. Dang Xuan Tho

Training Institution: Electric Power University

Summary of new contributions of the Dissertation

New Conclusion 1: Proposed a solution using meta-paths to improve the efficiency of drug-disease association prediction in a heterogeneous drug-protein-disease network.

- Proposed one new meta-path combined with three existing meta-paths from Wu et al. to maximize information extraction from intermediate nodes such as proteins.
- Identified six identity relationships (drug-drug, protein-protein, disease-disease) to propose three groups of meta-paths; the best combination was selected by choosing one sub-meta-path from each group.

New Conclusion 2: Proposes a Bayesian inference method to analyze the relationship between drugs and diseases in a heterogeneous drug–protein–disease network. At the same time, the proposed method applies data balancing techniques and selects highly reliable negative samples to improve the prediction of drug–disease relationships.

Ha Noi, December 26,2025

For Advisors **PhD. Student**

Dao Nam Anh **Lê Mạnh Hùng**