CURRICULUM VITAE

PERSONAL

NAME(姓名，含英譯)

陸行，Hsing Luh

PROFESSIONAL APPOINTMENT (現職，含英譯)

Dean of the college of Science, National Chengchi University

EDUCATION(學歷)

Ph.D. degree in Operations Research at North Carolina State University, USA

WORKING EXPERIENCE (經歷)

President of Operations Research Society of Taiwan from 2005 to 2007.

MAJOR RESEARCH AREA(研究領域)

Applied probability models, Development and analysis of assorted models in Optimization, Simulation and Forecasting.

PUBLICATION(In the nearest 5 years)(發表、出版物)

1. Jeng-Huei Chen, Shin-Yu Chen, Hsing Paul Luh, Rong-Nan Chien, Modeling Chronic HBV Infections with Survival Probability Metrics. 2017. Vol. 12, 29-42. Operations Research for Health Care. http://dx.doi.org/10.1016/j.orhc.2017.01.001
2. Zhaofu Hong, Wei Dai, Hsing Luh, Chenchen Yang, Optimal configuration of a green product supply chain with guaranteed service time and emission constraints, European Journal of Operational Research. 2017. https://doi.org/10.1016/j.ejor.2017.09.046
3. Bara Kim, Jerim Kim, Hsing Luh, Analysis of a Markovian feedback queue with multi-class customers and its application to the weighted round-robin queue, Annals of

Operations Research (ANOR) Ann Oper Res 2018.06. pp. 1-23. https://doi.org/10.1007/s10479-018-2917-9

4. Hsing Paul Luh and Pei-Chun Song, Matrix Analytic Solutions for M/M/S Retrial Queues with Impatient Customers, QTNA2019 in Springer Lecture Notes in Computer Science (LNCS) Proceedings, 16-33. August 2019. https://link.springer.com/book/10.1007/978-3-030-27181-7
5. Ming-Yen Lin, Jia-Sin Liu, Tzu-Yang Huang, Ping-Hsun Wu, Yi-Wen Chiu, Yihuang Kang, Chih Cheng Hsu, Shang-Jyh Hwang, Hsing Luh, (2021, Aug). Data analysis of the risks of type 2 diabetes mellitus complications before death using a data-driven modelling approach: methodologies and challenges in prolonged diseases. Information, 12(8), 326. https://doi.org/10.3390/info12080326.
6. Thomas T.H. Wan, Sarah Matthews, Hsing Luh, Yong Zeng, Zhibo Wang, Lin Yang, (2022, Mar). A Proposed Multi-Criteria Optimization Approach to Enhance Clinical Outcomes for Diabetes Care: A Commentary. Health Services Research and Managerial Epidemiology. doi.org/10.1177/23333928221089125. 2022 Mar 27; 9:23333928221089125.
7. Hsing Luh, Ming-Yen Lin, Ping-Hsun Wu,A Single Framework Of Precision Surveillance Of Diabetes Disease Prognosis For Better Care With Collaboration, Journal of Integrated Design and Process Science, 2022.
8. Ming-Yen Lin,Yi-Wen Chiu,Yu-Hsuan Lin,Yihuang Kang,Ping-Hsun Wu,Jeng-Huei Chen,Hsing Luh,Shang-Jyh Hwang, and on behalf of the iH3 Research Group, Kidney Health and Care Current Status, Challenges, and Developments, Journal of Personalized Medicine, (J. Pers. Med). 2023, 13(5), 702; https://doi.org/10.3390/jpm13050702.

II 型糖尿病併發症預測機制

Mechanism of Risk Assessment on Type 2 Diabetic Complications

陸行

國立政治大學理學院院長

This presentation investigates the long-term disease progress of type 2 Diabetes Mellitus (T2DM) and build a tree-based mechanism along with diabetic complications. We propose a time advanced Markovian approach to disease progression modeling of T2DM that aims to provide the ability to describe and quantify the time effect of the progressive pathways of T2DM. In order to characterize the natural progression of disease, this model was developed on longitudinal data from National Health Research Dataset.

(1) Background: A disease prediction model derived from real-world data is an important tool for managing type 2 diabetes mellitus (T2DM). This study described construction details of the T2DM Holistic Care model via estimating the probability of diabetes-related complications and the time-to-occurrence from a population-based database. (2) Methods: The model was based on the database of a Taiwan pay-for-performance reimbursement scheme for T2DM between November 2002 and July 2017. A nonhomogeneous Markov model was applied to simulate multistate (7 main complications and death) transition probabilities after considering the sequential and repeated difficulties. (3) Results: The Markov model was constructed based on clinical care information from 163,452 patients with T2DM. After simulating a cohort of 100,000 hypothetical patients over a 10-year time horizon based on selected patient characteristics at baseline, a good predicted complication and mortality rates with a small range of absolute error (0.3–3.2%) were validated in the original cohort. Better and optimal predictabilities were further confirmed compared to the UKPDS Outcomes model and applied the model to other Asian populations, respectively. (4) Contribution: The study provides well-elucidated evidence to apply real-world data to the estimation of the occurrence and time point of major diabetes-related complications over a patient's lifetime. Further applications in health decision science are encouraged.

It is concluded that, although its current implementation leaves room for further improvement, the mechanism-based approach presented here constitutes a promising conceptual advance in the study of T2DM disease progression and disease modification.