ENRICO LAOH

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Brief About Me

I am Enrico Laoh, a PhD candidate in Industrial Engineering and Management, specializing in advancing human-AI collaborative systems for high-stakes decision-making. My research integrates AI's precision with human reasoning to address critical challenges, particularly in healthcare, where I have developed explainable AI models for early disease detection. Additionally, I am exploring advanced technologies such as blockchain and federated learning to create secure and adaptable AI systems for diverse applications. With multiple publications, awards, and leadership experiences, including guiding my INFORMS chapter to national recognition, I am dedicated to impactful research, interdisciplinary collaboration, and innovation. As a recipient of the i-CORPS Creativity, Innovation, and Entrepreneurship Scholar Award, funded by NASA, I have also developed a business plan to commercialize my research, emphasizing its real-world applicability and societal value.

Educations

Doctor of Philosophy, OKLAHOMA STATE UNIVERSITY
Focus Area/Major: Industrial Engineering and Management
Degree GPA: 4.00/4.00 — Expected May 2025

Graduate Certificate, OKLAHOMA STATE UNIVERSITY
Focus Area/Major: Business Analytics and Data Science
Degree GPA: 4.00/4.00 — May 2023

Master of Science, OKLAHOMA STATE UNIVERSITY
Focus Area/Major: Industrial Engineering and Management
Degree GPA: 4.00/4.00 — December 2022

Master of Engineering, UNIVERSITAS INDONESIA
Focus Area/Major: Data and Quality Engineering
Degree GPA: 4.00/4.00 — July 2017

Bachelor of Engineering, UNIVERSITAS INDONESIA
Focus Area/ Major: Industrial Engineering
Degree GPA: 3.88/4.00 — July 2016

Selected Awards and Honors

- **Lisa Zaken Award for Excellence**, Institute of Industrial and System Engineers, 2024
  This international annual award, given only to one winner who has outstanding scholastic achievement, leadership, and dedication to the Industrial and System Engineering profession, demonstrates the highest of standards.
- **Third place in the 2024 IISE ESD/QCRE/PG&E Energy Analytics Challenge**, 2024
  Annual international competition by the Energy Analytics Society, judged by academia and industry practitioners.
- **President Leadership Recognition**, Hargis Leadership Institute, 2024
- **Outstanding Graduate Student Award**, CEAT Oklahoma State University, 2024
- **Robberson Dissertation Fellowship**, Oklahoma State University, 2024
- **Roy and Virginia Dorrough Distinguished Graduate Fellowship**, Oklahoma State University, 2023, 2024

- **Creativity, Innovation, and Entrepreneurship Scholar**, Spears School of Business, Oklahoma State University, 2021
- **IEEE SMC Society Merit Paper Awards**, 8th International Conference on Awareness Science and Technology (iCAST), 2017
  Given to the most outstanding paper in IEEE SMC academic society annually that is presented at the conference.
- **IEEE Indonesia Section Best Presenter Award**, 3rd International Conference on Science in Information Technology (ICSITech), 2017
  Given to the best-presented paper at the conference.

Work Experiences

DATA SCIENCE INTERN

UNITED AIRLINES INC., CHICAGO, ILLINOIS

June 2024 to August 2024

Observe the pricing main model and understand the effect of demand forecasting. Update the demand forecasting model and test novel variables extracted from internal databases and external potential influence. Successfully reduced the forecasting *MAPE by 2%.*

RESEARCH ASSISTANT

CENTER FOR HEALTH SYSTEMS INNOVATION, STILLWATER, OKLAHOMA

January 2024 to present

Develop frameworks and models to analyze healthcare data and synthesize knowledge to support a medical-based decision-making system. *Funded by a $1.2M NIH Grant.*

TEACHING AND RESEARCH ASSISTANT

SCHOOL OF INDUSTRIAL ENGINEERING AND MANAGEMENT, OSU, OKLAHOMA

January 2021 To Present

Do research on collecting, extracting, and building interpretable and explainable Machine Learning models from human physiological data (EEG, ECG, Eye Motion, etc.) to measure their stress level and cognitive state to help industrial AI-based systems generate a robust decision.

Give a tutorial for the Industrial Engineering and Data analytics-related courses.

LECTURER AND RESEARCH ASSOCIATE

INDUSTRIAL ENGINEERING DEPARTMENT, UI, INDONESIA

August 2017 – December 2020

Do research on applying descriptive, predictive, and prescriptive analytics for a wide range of industrial problems such as network optimization, power generation, customer segmentation, text summarization, and supply chain design.

Teach and conduct classes related to industrial engineering and data analytics.

Professional Memberships

- **Institute for Operations Research and the Management Sciences (INFORMS)**
  OSU Chapter President (2022-2023): Won the cum laude chapter award.
  Member since 2019.
- **Institute of Industrial and Systems Engineers (IISE)**
  Member since 2021.

Talks and Presentations

1. **"Big data analytics for healthcare."** National Board of Physicians of Indonesia, 2023.
2. **"A Modified Feature Selection Method to Build Interpretable and Trustable Machine Learning Model."** INFORMS Annual Meeting 2023, Phoenix, Arizona, October 2023.
3. **"Human-Centred Explainable Artificial Intelligent (XAI)."** INFORMS Annual Meeting 2021, Anaheim, California, October 2021.
4. **"Data Science and Its Applications."** SPWI Seminar Series, Depok, April 2019.
5. **"Data Mining with R." Data Mining Training SQE UI, Depok, September 2018.**
6. **"Enhancing hospitality sentiment reviews analysis performance using SVM N-grams method."** 16th International Conference on Service Systems and Service Management, Shenzhen, July 2019.
7. **"Indonesian's Song Lyrics Topic Modelling using Latent Dirichlet Allocation."** 5th IEEE International Conference on Information Science and Control Engineering, Zhengzhou, July 2018.
8. **"Reconfiguring oil distribution route using graph partitioning and graph optimization.",** IEEE 8th International Conference on Awareness Science and Technology, Taichung, Taiwan, November 2017.
9. **"Neural network-based system for detecting and diagnosing faults in steam turbine of thermal power plant.",** IEEE 8th International Conference on Awareness Science and Technology, Taichung, Taiwan, November 2017.
10. **"Electricity distribution clustering and configuration study using KM-MST",** IEEE 3rd International Conference on Science and Technology, Bandung, Indonesia, October 2017.
11. **"Data mining approach for short term load forecasting by combining wavelet transform and group method of data handling (WGMDH)",** IEEE 3rd International Conference on Science and Technology, Bandung, Indonesia, October 2017.
12. **"Opinion mining from online reviews in Bali tourist area",** IEEE 3rd International Conference on Science and Technology, Bandung, Indonesia, October 2017.
13. **"Clustered Electricity Distribution Configuration Using KM-MST Algorithm.",** International Conference on Computer Science and Technology Workshop, Seoul, South Korea, November 2016.

Publications

Patents

1. "**Product Service Systems for CNC (Computer Numerically Controlled) Lathes Machine Maintenance using Integrated Web-Based Application**" (2024) Indonesian Patent No. IDP000092940
2. "**Permissioned Blockchain System for Halal Supply Chain Through Hyperledger Fabric Web-Based Application**" Indonesian Patent (Submitted)

Journal Articles

1. **Laoh, E.,** Liu, T., "Incremental Learning with Multi-Group Data Stream for Diabetic Retinopathy Prediction" *(working paper).*
2. Dhini, A., Dwi, K., Surjandari, I., **Laoh, E.**, Dzikri, A., "Prediction of LOS for Heart Disease Patient using Ensemble Machine Learning Approach." *(working paper).*
3. **Laoh, E.,** Liu, T., "A Robust and Trustable Approach to Incorporate Medical Domain Knowledge in Machine Learning Models for Diabetic Retinopathy Screening Using Routine Lab Results" (2024) DOI: http://dx.doi.org/10.2139/ssrn.4950302.
4. Surjandari, I., Dzikri, A., Dhini, A., **Laoh, E.**, Dwi, K., Ferrouzi, D., "Stacked Generalization with Sequential-Model Based Optimization for estimating Used Car Valuation in Indonesia." *(2024) Engineering, Technology & Applied Science Research*. DOI: dx.doi.org/10.2139/ssrn.4388128.

Journal Articles

5. Surjandari, I., Yusuf, H., **Laoh, E.**, Maulida, R. "Designing a Permissioned Blockchain Network for the Halal Industry Using Hyperledger Fabric with Multiple Channels and the Raft Consensus Mechanism." Journal of Big Data (2021). Springer. DOI: 10.1186/s40537-020-00405-7.
6. **Laoh, E.**, Agustriwan, F., Megawati, C., Surjandari, I. "Internet Traffic Forecasting Model using Self Organizing Map and Support Vector Regression Algorithms." Makara Journal of Technology, Vol 22, No 2 (2018), pp. 60-65. DOI: 10.7454/mst.v22i2.3351.
7. Surjandari, I., Wayasti, R.A., **Laoh, E.**, Zulkarnain, Rus, A.M.M., Prawiradinata, I. "Mining public opinion on ride-hailing service providers using aspect-based sentiment analysis." International Journal of Technology, Vol 10, No 4 (2019) pages: 818-828. DOI: 10.14716/ijtech.v10i4.2860.

Conference Papers

1. Syaputra, A., **Laoh, E.**, "Customer Segmentation on Returned Product Customers Using Time Series Clustering Analysis." International Conference on ICT for Smart Society (ICISS) 2020, DOI: 10.1109/ICISS50791.2020.9307575
2. Rahmadianti, R., Dhini, A., **Laoh, E.**, "Estimating customer lifetime value using LRFM model in pharmaceutical and medical device distribution company." International Conference on ICT for Smart Society (ICISS) 2020, DOI: 10.1109/ICISS50791.2020.9307592
3. Ramadhani, S., Dhini, A., **Laoh, E.**, "Airline Passenger Forecasting using ARIMA and Artificial Neural Networks Approaches." International Conference on ICT for Smart Society (ICISS) 2020, DOI: 10.1109/ICISS50791.2020.9307571
4. Amira, R.F., Surjandari, I., **Laoh, E.**, "Jakarta Flood Risk Mapping Using Index-based Approach and Spatial Analysis." International Conference on ICT for Smart Society (ICISS) 2020, DOI: 10.1109/ICISS50791.2020.9307583
5. Dhini, A., Budiani, L.R., **Laoh, E.**, "Segmenting and Targeting the Potential Markets of a Muslim Fashion Company." International Conference on ICT for Smart Society (ICISS) 2020, DOI: 10.1109/ICISS50791.2020.9307604
6. Ilham, M.Y., Surjandari, I., **Laoh, E.,** "Analyzing highway road accident characteristic using data mining." International Workshop on Big Data and Information Security, IWBIS 2020, DOI: 10.1109/IWBIS50925. 2020.9255655.
7. Nur Prasasti, I.M., Dhini, A., **Laoh, E.,** "Automobile Insurance Fraud Detection using Supervised Classifiers." International Workshop on Big Data and Information Security, IWBIS 2020, DOI: 10.1109/IWBIS50925. 2020.9255563.
8. Hidayattullah, S., Surjandari, I., **Laoh, E**., "Financial statement fraud detection in Indonesia listed companies using machine learning based on meta-heuristic optimization." International Workshop on Big Data and Information Security, IWBIS 2020, DOI: 10.1109/IWBIS50925.2020.9255426.
9. Nadinta, D.S., Surjandari, I., **Laoh, E.,** "A clustering-based approach for reorganizing bus route on bus rapid transit system." Proceeding of 16th International Conference on Service Systems and Service Management, ICSSSM, Shenzhen: 2019, DOI: 10.1109/ICSSSM.2019.8887689.
10. Pramono, P.P., Surjandari, I., **Laoh, E.**, "Estimating customer segmentation based on customer lifetime value using two-stage clustering method." Proceeding of 16th International Conference on Service Systems and Service Management, ICSSSM, Shenzhen: 2019, DOI: 10.1109/ICSSSM.2019.8887704.
11. Prabaningtyas, N.I., Surjandari, I., **Laoh, E.**, "Mining customers opinion on services and applications of mobile payment companies in Indonesia using sentiment analysis approach." Proceeding of 16th International Conference on Service Systems and Service Management, ICSSSM, Shenzhen: 2019, 10.1109/ICSSSM.2019.8887643.
12. **Laoh, E.**, Surjandari, I., Febirautami, L. R. "Indonesian's Song Lyrics Topic Modelling using Latent Dirichlet Allocation." Proceeding of 5th International Conference on Information Science and Control Engineering, Zhengzhou: 2018, pp. 270-274. DOI: 10.1109/ICISCE.2018.00064.
13. Febirautami, L. R., Surjandari, I., **Laoh, E.** "Determining Characteristics of Popular Local Songs in Indonesia's Music Market." Proceeding of 5th International Conference on Information Science and Control Engineering, Zhengzhou: 2018, pp. 197-201. DOI: 10.1109/ICISCE.2018.00050.
14. Azitha, R., Surjandari, I., **Laoh, E.** "Mining Information Search Pattern on Website: A case study of educational institution." Proceeding of 5th International Conference on Information Science and Control

Engineering, Zhengzhou: 2018, pp. 326-330. DOI: 10.1109/ICISCE.2018.00075.

15. Surjandari, I., Rosyidah, A., Zulkarnain, **Laoh, E.** "Mining Web Log Data for News Topic Modeling Using Latent Dirichlet Allocation." Proceeding of 5th International Conference on Information Science and Control Engineering, Zhengzhou: 2018, pp. 331-335. DOI: 10.1109/ICISCE.2018.00076.
16. **Laoh, E.** Surjandari, I., Zulkarnain, "Reconfiguring oil distribution route using graph partitioning and graph optimization," 2017 IEEE 8th International Conference on Awareness Science and Technology (iCAST), Taichung, Taiwan, 2017, pp. 103-108. DOI: 10.1109/ICAwST.2017.8256426.
17. Prameswari, P., Surjandari, I., **Laoh, E.** "Opinion mining from online reviews in Bali tourist area," 2017 3rd International Conference on Science in Information Technology (ICSITech), Bandung, 2017, pp. 226-230. DOI: 10.1109/ICSITech.2017.8257115.
18. Prameswari, P., Zulkarnain, Surjandari, I., **Laoh, E.** "Mining online reviews in Indonesia's priority tourist destinations using sentiment analysis and text summarization approach," 2017 IEEE 8th International Conference on Awareness Science and Technology (iCAST), Taichung, Taiwan, 2017, pp. 121-126. DOI: 10.1109/ICAwST.2017.8256429.
19. **Laoh, E.** Surjandari, I., Dhini, A. "Electricity distribution clustering and configuration study using KM-MST," 2017 3rd International Conference on Science in Information Technology (ICSITech), Bandung, 2017, pp. 138-143. DOI: 10.1109/ICSITech.2017.8257099.
20. Yuniarti, T., Surjandari, I., Muslim, E., **Laoh, E.** "Data mining approach for short term load forecasting by combining wavelet transform and group method of data handling (WGMDH)," 2017 3rd International Conference on Science in Information Technology (ICSITech), Bandung, 2017, pp. 53-58. DOI: 10.1109/ICSITech.2017.8257085.
21. **Laoh, E.**, Surjandari, I., Dhini, A. "Clustered Electricity Distribution Configuration Using KM-MST Algorithm." Proceeding of International Conference on Computer Science and Technology, Seoul: 2016.
22. Maharani, A., Surjandari, I., Rachman, A., **Laoh, E.** "Graph Theory Approach to Analyze Reliability Index of Gas and Steam Power Plant." Proceeding of International Conference on Computer Science and Technology, Seoul: 2016.

Professional Services

Reviewer
- PeerJ Computer Science Journal
- Ain Shams Engineering Journal
- Indonesian Journal of Electrical Engineering and Computer Science
- International Conference on Quality in Research
- Asia Pacific Conference on Research in Industrial and System Engineering

Conference Committee
- **Technical Program Chair**, Asia Pacific Conference on Research in Industrial and Systems Engineering
- **Scientific Committee**, Asia Pacific Conference on Research in Industrial and Systems Engineering

Thesis Examiner
1. Designing Strategy Based on Experiential Values Factors Towards Customers Revisit Intention in Coffee Shop Inside Universitas Indonesia, 2020
2. Strategy recommendation for pay-later acceptance and loyalty on Generation Z in Jabodetabek, 2020
3. Feasibility investment analysis of geothermal project development using financial modeling (Study Case: Lumut Balai Geothermal Power Plant), 2020
4. Strategic planning to increase intention to donate money on Indonesia's online crowdfunding platform, 2020
5. Sustainable production modeling in the cement industry using system dynamics, 2020
6. Improved design and construction of hospital blood bank inventory management using an information system through the Internet of Things application, 2020
7. Designing radiological health equipment maintenance process improvement with the support of the Internet of Things (IoT), 2020

8. Remanufacturing Capacity Planning Model for Multigeneration Television Products in Closed-Loop Supply Chain with System Dynamics Method, 2019
9. Strategies to increase customer satisfaction and customer loyalty based on customer perceived values factors in Grand Kemang Hotel Jakarta, 2019
10. Strategies to increase willingness to lend toward peer-to-peer lending companies operating in Indonesia, 2019
11. Analysis of technology model adoption on health observation through smartwatches and fitness bands in Generation Y, X, and baby boomers in Indonesia, 2019
12. Model Development to Determine Optimal Drugs Inventory by Using Mixed Integer Linear Programming (MILP) in Public Health Services, 2019
13. Business process and card procurement mapping of PT MRT Jakarta at the station using inventory management analysis, 2018
14. Optimization of water truck usage in watering coal mine using integer linear programming, 2018
15. Repair line production with lean production system-based approach VSM (value stream mapping), 2018
16. Analysis of the Effect of Learning Media (Digital Based Vs Print Based) on the Ability to Understand Material in Terms of Attention and Mental Effort, 2018
17. Designing scheduling arrival of container trucks with trucks turnaround time method at terminal Peti Kemas Selatan PT Pelabuhan Tanjung Priok, 2018
18. Risk mitigation on the supply chain of the livestock industry using the house of risk approach, 2018
19. Prioritization of user's preferences for using mHealth services in Jakarta with analytic hierarchy process (AHP) approach, 2018