

Enrico Laoh

Graduate Student, Oklahoma State University
Industrial Engineering and Management
Business Analytics and Data Science

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Employment

Oklahoma State University

Graduate Research and Teaching Assistant, Industrial Engineering and Management 01/2021 – now

- Develop framework and models to analyze healthcare data and synthesize knowledge to support a medical-based decision-making system.
- 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.

Universitas Indonesia, Depok, Indonesia

Lecturer and Research Associate, Industrial Engineering Department 08/2017 – 01/2021

- 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 for the Industrial Engineering and Data analytics related courses.

Education

Doctor of Philosophy, Industrial Engineering and Management, Expected 05/2025
Oklahoma State University, Stillwater, United States

Graduate Certificate, Business Analytics, and Data Science, (GPA 4.00/4.00) 08/2023
Oklahoma State University, Stillwater, United States

Master of Science, Industrial Engineering and Management, (GPA 4.00/4.00) 12/2022
Oklahoma State University, Stillwater, United States

Master of Engineering, Data and Quality Engineering, (GPA 4.00/4.00) 07/2017
Universitas Indonesia, Depok, Indonesia

Bachelor of Engineering, Industrial Engineering, (GPA 3.88/4.00) 07/2016
Universitas Indonesia, Depok, Indonesia

Selected Awards and Honors

Alpha Pi Mu Honor Society 2022

School of Industrial Engineering and Management, Oklahoma State University

Tau Beta Pi Honor Society 2022

College of Engineering, Architecture and Technology, Oklahoma State University

Phi Kappa Phi Honor Society 2022

Graduate College, Oklahoma State University

Creativity, Innovation, and Entrepreneurship Scholar 2021

Spears School of Business, Oklahoma State University

Faculty of Engineering, Universitas Indonesia **International Publication Awards** 2018 and 2019

Annual Engineering Dean's Awards for International Publications

IEEE SMC Society **Merit Paper Awards** 2017

8th International Conference on Awareness Science and Technology (iCAST)

IEEE Indonesia Section **Best Presenter Award** 2017

3rd International Conference on Science in Information Technology (ICSITech)

Faculty of Engineering, Universitas Indonesia **Outstanding Engineering Students** 2016

Research Interest

My current research interest is to develop explainable artificial intelligence (XAI) frameworks and methodologies to support descriptive, predictive, and prescriptive analytics as motivated by and applied to high-stake decision-making support systems. I am especially interested in modeling, optimizing, and making applicable recommendations for industrial-related systems to improve the decision-aid system's quality and adaptability.

Methodology

Descriptive modeling, predictive modeling, data analytics, text analytics, statistical learning, multivariate analysis, applied statistics, clustering algorithm, classification algorithm, time series analysis, perturbation method, cognitive analytics, and physiological measurement.

Applications

Healthcare system, power system, route configuration, supply chain design, time series prediction, customer relationship analytics, sentiment analysis, and trends analytics.

Service Activities

Service to the Profession

Quality in Research Engineering Symposium	2021
• Reviewer	
The 16th International Conference on Service Systems and Service Management	2019
• Session Chair	
Asia Pacific Conference on Research in Industrial and Systems Engineering	2018, 2019,
• Technical Program Chair	2020, 2021
• Reviewer	

Service to the University

Vice President of GPSGA Oklahoma State University	2023 - now
• Reporting to the university about chapter performance	
• Maintaining chapter member engagement	
President of INFORMS Oklahoma State University	2022 - now
• Reporting to the university about chapter performance	
• Managing chapter social media	
• Maintaining chapter member engagement	
Graduate and Professional Student Government Association Liaison for IEM Department Oklahoma State University	2022 - 2023
• Represent the IEM Students in the graduate student body	
Statistics Student Consulting Team	2015 - 2017
• Conducting joint research with several industries (Commonwealth Research 2016, 2017)	
• Giving consultation for the undergraduate student thesis project	
Statistics and Quality Engineering Laboratory Universitas Indonesia	
• Chief of Internal Division: managing laboratory internal activities	2016
• Internal Division Staff: preparing internal training and arranging experiment module	2015

Service to the Community

BTA Group Academy, Jakarta, Indonesia	2014 - 2020
Quantitative and physics tutor	
UI Community Service, Jakarta, Indonesia	2019
Zero paper waste	
UI Community Service, Depok, Indonesia	2018
Science and technology house for UI developing village	

Collaboration in Grants and Funding

NEI 1R01EY033861-01 NIH Grants	2023
<i>SCH: Harnessing Tensor Information to Improve EHR Data Quality for Accurate Data-driven Screening of Diabetic Retinopathy with Routine Lab Results</i>	
<i>Amount awarded: \$ 1,194 million</i>	
PUTI Research Publication Grants	2020, 2022
<i>Amount awarded: \$ 7,000</i>	
Community Service Universitas Indonesia Grants	2019
<i>Amount awarded: \$ 5,000</i>	
PIT 9 Research Publication Grants	2019
<i>Amount awarded: \$ 18,000</i>	
Community Service Universitas Indonesia Grants	2019
<i>Amount awarded: \$ 5,000</i>	
PITTA Research Publication and Travel Grants	2018
<i>Amount awarded: \$ 6,000</i>	
PITTA Research Publication and Travel Grants	2017
<i>Amount awarded: \$ 6,000</i>	
PITTA Research Publication and Travel Grants	2016
<i>Amount awarded: \$ 6,000</i>	

Publications

Patents

1. "Permissioned Blockchain System for Halal Supply Chain Through Hyperledger Fabric Web Based Application" (2020) Indonesian Patent (Submitted)
2. "Product Service Systems for CNC (Computer Numerically Controlled) Lathes Machine Maintenance using the ISTAR 2017 Application" (2019) Indonesian Patent No. P00201801971

Journal Articles

1. Surjandari, I., Dzikri, A., Dhini, A., **Laoh, E.**, Dwi, K., "Stacked Generalization with Sequential Model-Based Optimization for Estimating Used Car Valuation." (2023) *preprint Expert System with Application*. DOI: dx.doi.org/10.2139/ssrn.4388128.
2. Dhini, A., Dwi, K., Surjandari, I., **Laoh, E.**, Dzikri, A., "Prediction of LOS for Heart Disease Patient using Ensemble Machine Learning Approach." (2023) *submitted to International Journal of Medical Informatics*.
3. 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.
4. **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.
5. 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/IWBIS50925.2020.9255653.
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, DOI: 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.

Presentations

Invited Talks

1. "Data Science and Its Applications." SPWI Seminar Series, Depok, April 2019.
2. "Data Mining with R." Data Mining Training SQE UI, Depok, September 2018.
3. "Factor Analysis (FA) and Principal Component Analysis (PCA) using R." FA and PCA Training SQE UI, Depok, September 2018.
4. "Demurrage Factor Analysis using Big Data Approach.", Industrial Engineering Student Seminar for Internship and Undergraduate Thesis Preparation, Depok, Indonesia, February 2017.
5. "Conducting Research using Structural Equation Modeling.", Statistics and Quality Engineering Student Training, Depok, Indonesia, March 2016.
6. "Dealing with Many Variables using Multivariate Analysis Method.", Statistics and Quality Engineering Student Training, Depok, Indonesia, March 2016.

Conference Presentations

1. "Human-Centred Explainable Artificial Intelligent (XAI)." INFORMS Annual Meeting 2021, Anaheim, California, October 2021.
2. "Enhancing hospitality sentiment reviews analysis performance using SVM N-grams method." 16th International Conference on Service Systems and Service Management, Shenzhen, July 2019.
3. "Indonesian's Song Lyrics Topic Modelling using Latent Dirichlet Allocation." 5th IEEE International Conference on Information Science and Control Engineering, Zhengzhou, July 2018.
4. "Reconfiguring oil distribution route using graph partitioning and graph optimization.", IEEE 8th International Conference on Awareness Science and Technology, Taichung, Taiwan, November 2017.
5. "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. "Electricity distribution clustering and configuration study using KM-MST", IEEE 3rd International Conference on Science and Technology, Bandung, Indonesia, October 2017.
6. "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.
7. "Opinion mining from online reviews in Bali tourist area", IEEE 3rd International Conference on Science and Technology, Bandung, Indonesia, October 2017.
8. "Clustered Electricity Distribution Configuration Using KM-MST Algorithm.", International Conference on Computer Science and Technology Workshop, Seoul, South Korea, November 2016.

Teaching Experiences

University Teaching

I have teaching experience with the following courses at the university level:

- IEM 4913: Senior Design, Oklahoma State University
- IEM 3503: Engineering Economic Analysis, Oklahoma State University
- IEM 3513: Economic Decision Analysis, Oklahoma State University
- IEM 3813: Work Design, Ergonomics, and Human Performance
- ENGE600001: Calculus, Universitas Indonesia
- ENGE600002: Linear Algebra, Universitas Indonesia
- ENGE600011: Engineering Economics, Universitas Indonesia
- ENIE601002: Introduction to Economics, Universitas Indonesia
- ENIE601004: Probability Theory, Universitas Indonesia
- ENIE603006: Basic Statistics, Universitas Indonesia
- ENIE603007: Linear Programming, Universitas Indonesia
- ENIE604011: Industrial Statistics, Universitas Indonesia
- ENIE604015: Computational Method for IE, Universitas Indonesia
- ENIE604016: Operations Research, Universitas Indonesia
- ENIE606051: Decision, Uncertainty and Risk, Universitas Indonesia
- ENIE616027: Information System, Universitas Indonesia
- ENIE801006: Advance Statistics for IE, Universitas Indonesia
- ENIE802537: Decision Analysis and Risk Management, Universitas Indonesia

- ENIE803433: Multivariate Data Analysis, Universitas Indonesia
- ENGE600003: Fundamental of Physics, Universitas Indonesia
- ENGE600005: Statistics and Probabilistic, Universitas Indonesia

Course	Position	Semester	Instructor Rating	Class Type
IEM 4913	GTA	Spring 2023	n.a.	In-person
IEM 4913	GTA	Fall 2022	n.a.	In-person
IEM 3813	GTA	Fall 2022	n.a.	In-person & Lab
IEM 4913	GTA	Spring 2022	n.a.	In-person
IEM 4913	GTA	Fall 2021	n.a.	In-person
IEM 3503	GTA	Summer 2021	n.a.	Online
IEM 3513	GTA	Spring 2021	n.a.	In-person
ENGE600001	Instructor	Ganjil 2020	5.42 of 6.00	Regular
ENGE600001	Instructor	Ganjil 2019	5.18 of 6.00	Regular
ENGE600001	Instructor	Ganjil 2018	4.95 of 6.00	Regular
ENGE600002	Instructor	Genap 2020	5.20 of 6.00	Regular
ENGE600002	Instructor	SP 2019	5.53 of 6.00	Regular
ENGE600002	Instructor	Genap 2019	5.02 of 6.00	Regular
ENGE600002	Instructor	SP 2018	5.42 of 6.00	Regular
ENGE600011	Instructor	SP 2019	4.90 of 6.00	Regular
ENIE601002	Instructor	Ganjil 2020	5.73 of 6.00	Regular
ENIE601002	Instructor	Ganjil 2019	5.59 of 6.00	Regular
ENIE601002	Instructor	Ganjil 2018	5.40 of 6.00	Regular
ENIE601004	Instructor	Ganjil 2020	5.70 of 6.00	Regular
ENIE603006	Instructor	Ganjil 2020	5.55 of 6.00	Regular
ENIE603006	Instructor	Ganjil 2019	5.09 of 6.00	International
ENIE603006	Instructor	Ganjil 2018	5.46 of 6.00	International
ENIE603006	Instructor	Ganjil 2017	5.04 of 6.00	International
ENIE603007	Instructor	Ganjil 2019	5.04 of 6.00	International
ENIE604011	Instructor	Genap 2019	5.59 of 6.00	International
ENIE604011	Instructor	Genap 2018	5.29 of 6.00	International
ENIE604015	Instructor	Genap 2020	4.90 of 6.00	Regular
ENIE604015	Instructor	Genap 2018	5.29 of 6.00	International
ENIE604016	Instructor	Genap 2020	5.16 of 6.00	International
ENIE604016	Instructor	Genap 2018	5.31 of 6.00	Regular
ENIE606051	Instructor	Genap 2020	5.46 of 6.00	Regular
ENIE606051	Instructor	Genap 2019	5.59 of 6.00	International
ENIE606051	Instructor	Genap 2019	5.57 of 6.00	Regular
ENIE616027	Instructor	Genap 2020	5.56 of 6.00	International
ENIE616027	Instructor	Genap 2019	5.34 of 6.00	International
ENIE601002	GTA	Ganjil 2016	n.a.	Regular
ENIE603006	GTA	Ganjil 2016	n.a.	Regular
ENIE801006	GTA	Genap 2017	n.a.	Regular
ENIE802537	GTA	Genap 2017	n.a.	Regular
ENIE803433	GTA	Ganjil 2016	n.a.	Regular
ENGE600002	UTA	Genap 2015	n.a.	Regular
ENGE600003	UTA	Ganjil 2014	n.a.	Regular
ENGE600005	UTA	Genap 2014	n.a.	Regular

Notes: GTA = Graduate Teaching Assistant UTA = Undergraduate Teaching Assistant

Ganjil = similar to Fall Term Genap = similar to Spring Term SP = similar to Summer Term

n.a. = not available

Regular = class taught entirely in Indonesian International = class taught entirely in English

Other Teaching

In addition to teaching at the university level, I have had the opportunity to teach in other capacities.

Course	Position	Grade Level	Institution	Dates
Physics	Course Instructor	12 th Grade	BTA Academy, Jakarta, ID	Jan 2014 - Dec 2020
Physics	Course Instructor	11 th Grade	BTA Academy, Jakarta, ID	Jan 2014 - Dec 2020
Physics	Course Instructor	10 th Grade	BTA Academy, Jakarta, ID	Jan 2014 - Dec 2020
Physics	Course Instructor	9 th Grade	BTA Academy, Jakarta, ID	Jan 2014 - Dec 2020
Physics	Book Author and Module Supervisor	10 th Grade	BTA Academy, Jakarta, ID	Jul 2017 - Jun 2020

Industry Experiences

PT PJB Indonesia (Indonesia Power Generation Company) 2020

Asset management and performance health management framework and process detail design

PT PJB Indonesia (Indonesia Power Generation Company) 2019, 2020

Quality and Reliability Engineering Trainer

PT Pertamina (Indonesia Oil and Gas Company) 2016

Supply and Distribution Analyst Internship

- Working as co-analyst for improving the distribution system
- Doing feasibility studies for new distribution location expansion

PT Pertamina (Indonesia Oil and Gas Company) 2015

Student Research Program

- Conducting a re-optimization distribution pattern research project

Programming and Software Skills

Programming Languages: R, Python, SQL, MatLab, Java

Software: IBM SPSS, Statistica, Rapid Miner, R Studio, Jupiter, ProModel, Minitab, Palisade Decision Tools, Ms Access, MySQL, Tableau, Supply Chain Guru

Certification: Certified Six Sigma Green Belt, Tableau Desktop Specialist (<https://www.credly.com/badges/81bf5494-2a61-4259-a33c-955eb27a8265>), Supply Chain Design (<https://scq.io/bIGf5pL>)

Professional & Academic Society

Institute for Operations Research and the Management Sciences (INFORMS)

Institute of Industrial and Systems Engineers (IISE)