Curriculum Vitae

Herdiantri Sufriyana, MD, PhD
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Selected publication more

2025. **Sufriyana H**, Romadlon DS, Kurniawan R, Al Baqi S, Ekpor E, Peprah Osei E, Chiu HY, Su ECY. **Large language model**-assisted **causal machine learning** for identifying fatigue-related poor glycated hemoglobin in type 2 diabetes. medRxiv. 2025 Feb;2025.02.10.25321977v1. DOI: 10.1101/2025.02.10.25321977

2025. **Sufriyana H**, Su ECY. rplec: An R package of **placental epigenetic clock** to estimate aging by DNA-methylation-based gestational age. bioRxiv. 2025 Feb;2025.02.04.636367v1. DOI: 10.1101/2025.02.04.636367

2025. **Sufriyana H**, Su ECY. rmlnomogram: An R package to construct an **explainable nomogram** for any **machine learning** algorithms. arXiv. 2025 Jan;2501.05772v1. DOI: 10.48550/arXiv.2501.05772

2024. **Sufriyana H**, Chen C, Chiu HS, Sumazin P, Yang PY, Kang JH, Su ECY. Estimating individual risk of catheter-associated urinary tract infections using **explainable artificial intelligence** on clinical data. Am J Infect Control. 2024 Oct;S0196-6553(24): 00819-8. DOI: 10.1016/j.ajic.2024.10.027

2024. **Sufriyana H**, Wu YW, Su ECY. Low- and high-level information analyses of **transcriptome** connecting endometrial-decidua-placental origin of **preeclampsia** subtypes: A preliminary study. Pac Symp Biocomput. 2024 Jan;29: 549-563. DOI: 10.1142/9789811286421_0042

2024. **Sufriyana H**, Amani FZ, Al Hajiri AZZ, Wu YW, Su ECY. **Prognosticating** fetal growth restriction and small for gestational age by medical history. Stud Health Technol Inform. 2024 Jan;25:310: 740-744. DOI: 10.3233/SHTI231063

2023. Vidyanti AN, Satiti S, Khairani AF, Fauzi AR, Hardhantyo M, **Sufriyana H**, Su ECY. Symptom-based scoring technique by **machine learning** to predict COVID-19: a validation study. BMC Infectious Diseases. 2023 Dec;23(1): 871. DOI: 10.1186/s12879-023-08846-0

2023. **Sufriyana H**, Wu YW, Su ECY. Human-guided **deep learning** with ante-hoc explainability by convolutional network from non-image data for pregnancy **prognostication**. Neural Networks. 2023 May;162: 99-116. DOI: 10.1016/j.neunet.2023.02.020

2022. **Sufriyana H**, Salim HM, Muhammad AR, Wu YW, Su ECY. **Blood biomarkers** representing maternal-fetal interface tissues used to predict early-and late-onset **preeclampsia** but not COVID-19 infection. Comput Struct Biotechnol J. 2022 Aug;20: 4206-4224. DOI: 10.1016/j.csbj.2022.08.011

2021. Yu CJ, Yeh HJ, Chang CC, Tang JH, Kao WY, Chen WC, Huang YJ, Li CH, Chang WH, Lin YT, **Sufriyana H**, Su ECY. Lightweight **deep neural networks** for cholelithiasis and cholecystitis detection by point-of-care ultrasound. Computer Methods and Programs in Biomedicine. 2021 Nov;211: 106382. DOI: 10.1016/j.cmpb.2021.106382

2020. **Sufriyana H**, Husnayain A, Chen YL, Kuo CY, Singh O, Yeh TY, Wu YW, Su ECY. Comparison of multivariable logistic regression and other **machine learning** algorithms for **prognostic prediction** studies in **pregnancy** care: Systematic review and meta-analysis. JMIR Med Inform. 2020 Nov;8(11): e16503. DOI: 10.2196/16503

2020. **Sufriyana H**, Wu YW, Su ECY. Prediction of **preeclampsia** and intrauterine growth restriction: development of **machine learning** models on a prospective cohort. JMIR Med Inform. 2020 May;8(5): e15411. DOI: 10.2196/15411

2020. **Sufriyana H**, Wu YW, Su ECY. **Artificial intelligence-assisted prediction** of **preeclampsia**: Development and external validation of a nationwide health insurance dataset of the BPJS Kesehatan in Indonesia. EBioMedicine. 2020 Apr;54: 102710. DOI: 10.1016/j.ebiom.2020.102710

Research interest

AI in Obstetrics
Preeclampsia
Prognostic Prediction
Causal Inference
Pathway Analysis

Language

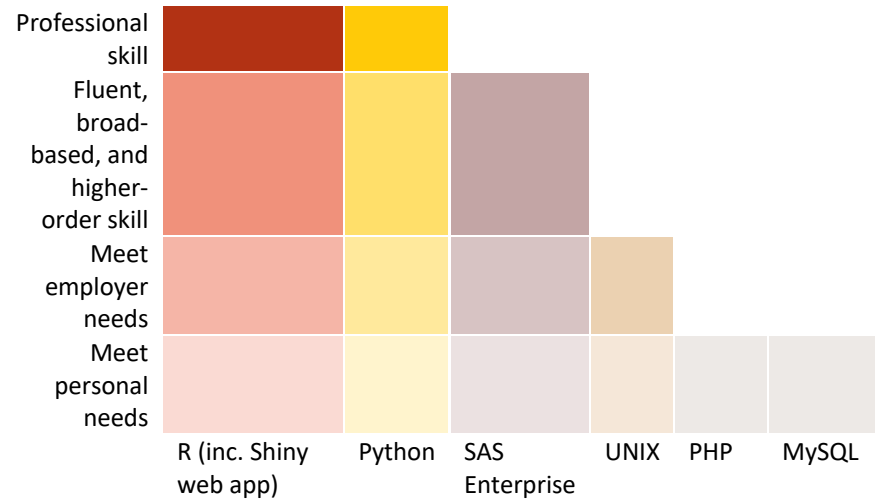
English Indonesian

Software more

rplec [a, b]
rmlnomogram [a, b]
rcausim [b]
divnn [b, c]
gmethods [b]
clixo [b]
medhist [b]
rsdr [b]
alignontology [b]
PROM Time [d]
Pre GDS-15 [d]
FGR/SGA [d]
CA-UTI 6 days [d]
Fatigue-HbA1c [d]

[a] R package in CRAN
[b] R package in Github
[c] Python library in Github
[d] Shiny web app

Skill level



Education

2018 – 2022: Ph.D. in Biomedical Informatics, College of Medical Science and Technology, Taipei Medical University, Taiwan
2015 – 2017: Master in Biomedical Science Program (Physiology), Faculty of Medicine, Universitas Airlangga, Indonesia
2009 – 2012: M.D., Faculty of Medicine, Universitas Lambung Mangkurat, Indonesia
2003 – 2007: Bachelor in Medicine, Faculty of Medicine, Universitas Lambung Mangkurat, Indonesia

Work experience Back to top

2024 – present: Postdoctoral Researcher in Institute of Biomedical Informatics, National Yang-Ming Chiao-Tung University, Taipei, Taiwan
2022 – 2024: Postdoctoral Researcher in Graduate Institute of Biomedical Informatics, College of Medical Science and Technology, Taipei Medical University, Taipei, Taiwan
2018 – 2022: Research assistant in Graduate Institute of Biomedical Informatics, College of Medical Science and Technology, Taipei Medical University, Taipei, Taiwan
2015 – 2022: Vice Dean of Planning, Development, and Collaboration in Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia
2015 – present: Lecturer in Department of Medical Physiology, Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia
2015 – 2016: Physician in Emergency Department, Surabaya Islamic Hospital Jemursari, Surabaya, Indonesia
2012 – 2015: Lecturer in Sari Mulia College of Midwifery, Banjarmasin, Indonesia
2012 – 2015: Physician in Sari Mulia Obstetric Clinic, Banjarmasin, Indonesia

Funding acquisition Back to top

2024 – 2027: The Postdoctoral Accompanies Research Project from the National Science and Technology Council (NSTC) in Taiwan to Herdiantri Sufriyana (independent research grant supporting an umbrella project).
2021 – 2024: The National Science and Technology Council (NSTC) in Taiwan to Emily Chia-Yu Su (primarily assist in the preparation of grant). Main publications: (1) 10.1016/j.neunet.2023.02.020; (2) https://doi.org/10.1142/9789811286421_0042.
2022 – 2024: The Postdoctoral Accompanies Research Project from the National Science and Technology Council (NSTC) in Taiwan to Herdiantri Sufriyana (independent research grant supporting an umbrella project). Main publications: (1) 10.3233/shti231063; (2) 10.1101/2024.01.08.24300958.
2022 – 2024: The Taipei University System (TUS) in Taiwan to Emily Chia-Yu Su (primarily assist in the preparation of grant).
2021 – 2022: Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas Nahdatul Ulama Surabaya in Indonesia to Herdiantri Sufriyana (independent research grant). Main publications: (1) 10.1101/2024.01.08.24300958.
2021 – 2022: Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas Nahdatul Ulama Surabaya in Indonesia to Herdiantri Sufriyana (independent research grant). Main publications: (1) 10.1016/j.csbj.2022.08.011.
2021 – 2024: The Higher Education Sprout Project from the Ministry of Education (MOE) in Taiwan to Emily Chia-Yu Su (primarily assist in the preparation of grant).
2021 – 2024: The Ministry of Science and Technology (MOST) in Taiwan to Emily Chia-Yu Su (primarily assist in the preparation of grant). Main publications: (1) 10.1016/j.neunet.2023.02.020; (2) https://doi.org/10.1142/9789811286421_0042.
2020 – 2021: The Ministry of Science and Technology (MOST) in Taiwan to Emily Chia-Yu Su (partially assist in the preparation of grant). Main publications: (1) 10.2196/16503; (2) 10.1016/j.ebiom.2020.102710; (3) 10.2196/15411.

Award Back to top

2024: 1st Winner Placental Clock DREAM Challenge.
2024: Pacific Symposium on Biocomputing (PSB) Travel Support
2024: National Science and Technology Council (NSTC) Subsidy for Domestic Experts and Scholars to Attend International Academic Conferences (grant no. NSTC113-2914-I-038-001-A1)
2023: Taipei Medical University (TMU) Outstanding Postdoctoral Researcher Award
2023: National Science and Technology Council (NSTC) Subsidy for Domestic Experts and Scholars to Attend International Academic Conferences (grant no. NSTC112-2914-I-038-001-A1)
2022: Taipei Medical University (TMU) Valedictorian
2018: The Ministry of Education (MoE) in Taiwan Scholarship
2018: Taipei Medical University (TMU) International Student Scholarship A
2017: Universitas Airlangga Faculty of Medicine Best Master Graduate

Other publications Back to top

1. 2024. Nanda JD, Yeh TM, Satria RD, Jhan MK, Wang YT, Lin YL, **Sufriyana H**, Su ECY, Lin CF, Ho TS. Dengue virus non-structural protein 1 binding to thrombin as a dengue **severity marker**: Comprehensive patient analysis in south Taiwan. J Microbiol Immunol Infect. 2024 Dec;S1684-1182(24): 00230-5. DOI: 10.1016/j.jmii.2024.12.004
2. 2023. Susanty S, **Sufriyana H**, Su ECY, Chuang YH. Questionnaire-free **machine-learning** method to predict depressive symptoms among community-dwelling older adults. PLOS One. 2023 Jan;18(1): e0280330. DOI: 10.1371/journal.pone.0280330
3. 2021. Chou CT, Yeh HJ, Chang CC, Tang JH, Kao WY, Su I, Li CH, Chang WH, Huang CK, **Sufriyana H**, Su ECY. **Deep learning** for abdominal ultrasound: A computer-aided diagnostic system for the severity of fatty liver. J Chin Med Assoc. 2021 Jul;84(9): 842-850. DOI: 10.1097/jcma.0000000000000585
4. 2019. Widyaswari MS, Noventi I, **Sufriyana H***. Anti-eczema mechanism of action of *Nigella sativa* for atopic dermatitis: **Computer-aided prediction** and **pathway analysis** based on protein-chemical interaction networks. Molecular and Health Science Journal 2(2): 68–74. DOI: 10.20473/bhsj.v2i2.15007
5. 2018. **Sufriyana H***, Farindra I. Indonesian Islamic educational tradition meets emerging technologies: Implementation of the e-Sorogan **learning technological model** in medical education. 5th South East Asia Regional Association for Medical Education Conference. May 5th to 8th. [PDF]
6. 2018. **Sufriyana H***, Bambang Edi Suwito. Developing e-Bandongan as a **learning system** for flipped classroom in medical education and massive open online courses in medical long-life learning. 5th South East Asia Regional Association for Medical Education Conference. May 5th to 8th. [PDF]
7. 2018. Handayani*, **Sufriyana H**, Firdaus AAA. [**Focus** Skill was Associated with Reaction Time, but not with **Sleep** Pattern of Students in Islamic Boarding School]. Qanun Medika 2(1). DOI: 10.30651/qm.v2i01.655
8. 2017. **Sufriyana H**, Luqman EM, Rejeki PS. Effect of Moderate-Intensity Endurance Training on Integrins Expression as Biomarkers of **Epithelial-to-Mesenchymal Transition** at the End of First-Week Gestation in Mice. Thesis in master degree. Airlangga University. [URL]
9. 2017. **Sufriyana H***, Handayani L, Yuliana F, Syafii MT. [Potential Use of Modified **PIERS Model** to Predict Outcome of Women with **Preeclampsia** at Type B Hospital in Indonesia: Retrospective Study in Ansari Saleh Hospital, South Kalimantan]. Medical and Health Science 1(1). DOI: 10.33086/mhsj.v1i1.614
10. 2017. Rosadi SL*, Khadijah S, **Sufriyana H**. The Effect of Student's Interest and Motivation to Final Score of Methodology of Research and Basic **Statistic** Subject at Sari Mulia Midwifery Academy. 2nd Sari Mulia International Conference on Health and Sciences 2017 (SMICHS). December. DOI: 10.2991/smichs-17.2017.30
11. 2015. Handayani L*, **Sufriyana H**, Humaira MM. [Birth Weight and Gestational Age of Newborn From Women with **Preeclampsia** in Ansari Saleh Hospital of Banjarmasin]. Dinamika Kesehatan 15. [PDF]
12. 2015. Mahdiyah D*, Normansyah S, **Sufriyana H**. [Several Factors Associated to Prevalence of **Exclusive Breastfeeding** in Gadang Hanyar Public Health Center of Banjarmasin]. Media Sains 8. [URL]
13. 2014. **Sufriyana H***, Handayani L. [Vascular Age and Stress Profile of Pregnant Women Based on **Photoplethysmogram**]. Dinamika Kesehatan 14. [PDF]
14. 2014. **Sufriyana H***. [Psychopathology and Personality of Students of Sari Mulia College of Midwifery Based on **MMPI-2**]. Dinamika Kesehatan 13. [PDF]

Description of software Back to top

rplec (R package in CRAN) Placental Epigenetic Clock to Estimate Aging by DNA Methylation. Placental epigenetic clock to estimate aging based on gestational age using DNA methylation levels, so called placental epigenetic clock (PlEC). We developed a PlEC for the 2024 Placental Clock DREAM Challenge (<https://www.synapse.org/Synapse:syn59520082/wiki/628063>). Our PlEC achieved the top performance based on an independent test set. PlEC can be used to identify accelerated/decelerated aging of placenta for understanding placental dysfunction-related conditions, e.g., great obstetrical syndromes including preeclampsia, fetal growth restriction, preterm labor, preterm premature rupture of the membranes, late spontaneous abortion, and placental abruption.

rmlnomogram (R package in CRAN) Construct Explainable Nomogram for a Machine Learning Model. Construct an explainable nomogram for a machine learning (ML) model to improve availability of an ML prediction model in addition to a computer application, particularly in a situation where a computer, a mobile phone, an internet connection, or the application accessibility are unreliable. This package enables a nomogram creation for any ML prediction models, which is conventionally limited to only a linear/logistic regression model. This nomogram may indicate the explainability value per feature, e.g., the Shapley additive explanation value, for each individual. However, this package only allows a nomogram creation for a model using categorical without or with single numerical predictors.

rcausim (R package in CRAN) Generate Causally-Simulated Data. Thia package provides tools to assist in defining functions based on specified edges, and conversely, defining edges based on functions. It enables the generation of data according to these predefined functions and causal structures. Data simulation adheres to principles of structural causal modeling.

divnn (R package & Python library in Github) An implementation of the DeepInsight Visible Neural Network. This package facilitates application of DeepInsight (DI) and Visible Neural Network (VNN) algorithms from Alok Sharma (2019) and Michael Ku Yu (2018), respectively.

gmethods (R package in Github). An implementation of g-methods. This package facilitates causal inference by implementing g-methods: g-formula, inverse probability weighting (IPW), and g-estimation. These methods are comprehensively described in Causal Inference: What If book by Hernán and Robins (2020).

clixo (R package in Github) An implementation of Clique Extracted Ontology algorithm. This package facilitates application of Clique Extracted Ontology (CliXO) algorithm from Michael Kramer (2014).

medhist (R package in Github) A preprocessor to construct medical history table from data source. This package constructs a medical-history table from several tables of an electronic medical record database. The medical-history table may be utilized for both causal and predictive modeling.

rsdr (R package in Github) Re-sampled dimensional reduction (RSDR). This package applies a resampling method to estimate rotated matrix for dimensional reduction. This helps to fulfill minimum events per variable (EPV) for a machine learning algorithm while optimizing the proportion of variance explained (PVE). Unlike

alignontology (R package in Github) An implementation of alignment in Network-Extracted Ontology algorithm. This package facilitates application of ontology alignment in Network-Extracted Ontology (NeXO) algorithm in R. This algorithm was originally implemented in C++ by Michael Kramer for NeXO algorithm found by Janusz Dutkowski (2013).

PROM Time (Shiny web app) A deployment of prognostic models for prelabor rupture of membranes (PROM) and the time of delivery. Only medical histories by ICD-10 codes of diagnosis and procedure are needed to predict PROM and estimate how many days from prediction time a pregnant woman will deliver a baby.

Pre GDS-15 (Shiny web app) A deployment of a diagnostic model for routine screening of depressive symptoms without questionnaire for older adults. This is intended to prevent questionnaire fatigue. The positives will be assessed further the condition using the standard screening questionnaire, i.e. Geriatric Depression Scale (GDS)-15.

FGR/SGA (Shiny web app) A deployment of a prognostic model for fetal growth restriction (FGR)/small gestational for age (SGA). Only medical histories by ICD-10 codes of diagnosis and procedure are needed to predict FGR/SGA.

CA-UTI 6 days (Shiny web app) A deployment of a prognostic model for catheter-associated urinary tract infections within six days among hospitalized individuals receiving urinary catheterization. Fourteen predictors from electronic health records are needed to predict CA-UTI. The paper-based substitute is also available (i.e., nomogram).

Fatigue-HbA1c (Shiny web app) A deployment of a prognostic model based on a structural causal model to identify whether current fatigue is related to poor HbA1c last 3 months among individuals with type 2 diabetes.