Jae Yong Yu

Education

2018.03 – 2023.02
Ph.D. in Digital Health, Sungkyunkwan University (SKKU),
Samsung Advanced Institute for Health Sciences & Technology (SAIHST)

2015.09 – 2017.08
M.S. in Statistics, University of Seoul (UOS), KOREA

2008.03 – 2014.02
B.S. in Statistics, ChungBuk National University (CBNU), ChungBuk, KOREA

Career

2023.02 – Present
Research Professor, Department of Biomedical Systems Informatics, Yonsei University College of Medicine, Seoul, Korea

2017.09 – 2023.02
Statistics Researcher, Samsung Medical Center (SMC), Smart Health Lab (SHL)

- Implemented data cleaning of SMC EMR (Electronic medical record) using R studio
- Developed and validated of machine learning based triage score for emergency department
- Designed a model for field triage score with Asian cohort
- Built a machine learning based critical intervention suggestion model for emergency department.
- Collaborated with common data model (CDM) team to build SMC CDM.
- Led a team of statistics in SHL
- Implemented various statistical analysis

2021.09 – 2022.09 (Global Research Training Program)
Visiting Research Fellow in Digital Smart & Health Office (DSHO), Tan Tock Seng Hospital (TTSH), Singapore
Visiting Research Fellow in Digital Medicine Lab, Duke-NUS, Singapore

- Conducted external validation of interpretable machine learning model (Autoscore) for emergency department using SMC data
- Developed Korea version interpretable machine learning model using 3 hospitals in Korea.

- Developed of partial dependent based machine learning model for emergency department
- Conducted comparison of digital transformation between Singapore and Korea
- Four times of English R studio lecture for TTSH staff

2014.08 – 2015.11
Statistics Researcher, Seoul National University of Hospital (SNUH), LEMS (Laboratory of Emergency Medical Services),

- Data preprocessing for quality management of emergency medical services database using SAS
- Data gathering for management of database for EMS-assessed sudden cardiac arrest and mass casualty severe trauma
- Conducted descriptive statistics for exploratory data analysis using SAS
- Wrote papers for each research

Skill Set

Data Science
– Programming (R,SAS)
– Machine Learning
– Medical Statistics
– Digital Healthcare
– Process Mining

Data Standard

– Common Data Model (CDM)

Publication (ordered by date)

• Jae Yong Yu, Sejin Heo, Feng Xie, Nan Liu, Marcus Eng Hock Ong, Yih Yng Ng, Sang Do shin, Kentaro Kajino, Won Chul Cha. Development and Asian-wide validation of the Grade for Interpretable Field Triage (GIFT) for predicting mortality in pre-hospital patients using the Pan-Asian Trauma Outcomes Study (PATOS). The Lancet Regional Health - Western Pacific, 2023,100733, ISSN 2666-6065

• Yu, J.Y., Xie, F., Nan, L. et al. An external validation study of the Score for Emergency Risk Prediction (SERP), an interpretable machine learning-based triage score for the emergency department. Sci Rep 12, 17466 (2022). https://doi.org/10.1038/s41598-022-22233-w.

• MinHa Kim, Jae Yong Yu, Hansol Chang, Sejin Heo, Se Uk Lee, Sung Yeon Hwang, Hee Yoon,Won Chul Cha, Tae Gun Shin, Taerim Kim. National Surveillance of Pediactric Out-of-Hospital Cardiac Arrest in Korea: The 10-Year Trend From 2009 to 2018 . Journal of Korea Medical Science. 2022;37(44),

• Park H, Chae MK, Jeong W, Yu J, Jung W, Chang H, Cha WC. Appropriateness of Alerts and Physicians' Responses With a Medication-Related Clinical Decision Support System: Retrospective Observational Study JMIR Medical Informatics. 18/09/2022:40511

• Jonathan Shen You Ng, Reuben Jia Shun Ho, Jae Yong Yu, Yih Yng NG. Factors influencing success and safety of AED retrieval in out of hospital cardiac arrests in Singapore. Korean J Emerg Med Ser. 2022;26(2):97-111.　　Published online August 31, 2022 DOI: https://doi.org/10.14408/KJEMS.2022.26.2.097

• Shim S, Yu JY (Co 1st Author),, Jekal S, Song YJ, Moon KT, Lee JH, Yeom KM, Park SH, Cho IS, Song MR, Cha WC, Hong JH. Development and Validation of Interpretable Machine Learning Models for Inpatient Fall Events and EMR Integration. Clin Exp Emerg Med. 2022 Sep 21. doi: 10.15441/ceem.22.354. PMID: 36128798.

• Hansol Change, Jae Yong Yu (Co 1st Author), SunYoung Yoon and Cha WC. Machine learning-based suggestion for critical interventions in the management of potentially severe conditioned patients in emergency department triage . Sci Rep 12, 10537 (2022 June). https://doi.org/10.1038/s41598-022-14422-4

• Yu JY, Chang HS, Cha WC. Predicting Mid-Term Survival of Patients During Emergency Department Triage for Resuscitation Decision. Journal of Anesthesia, Intensive Care, Emergency and Pain Medicine. 2022 Mar ;10.22514/sv.2022.018

• Yu JY, Hong SJ, Shin SY. Stakeholders' Requirements of Artificial Intelligence for Healthcare in Korea. Healthc Inform Res. 2022 Apr. 28(2):143-151 ; 10.4258/hir.2022.28.2.143

• Dohyung Kim, Weong Jeong, Yu JY and WonChul Cha. Effect of fever or respiratory symptoms on leaving without being seen during the COVID-19 pandemic in South Korea. Clin Exp Emerg Med. 2022 Mar. 9(1):1-9 ;

• Chang Hansol, JaeYong Yu (Co 1st Author) and Taerim Kim, "Change in ED process during the COVID-19 pandemic and its effect on that in presumed CVD patients", Journal of Clinical Medicine, 2020. Nov

• WonChul Cha, Won Jeong, JaeYong Yu and Jinwook choi, "Temporal Change in Alert Override Rate with a Minimally Interruptive Clinical Decision Support on a Next-Generation Electronic Medical Record", Medicina, 2020. Nov

• Yu JY, Jeong GY, Jeong OS, Chang DK, Cha WC. Machine Learning and Initial Nursing Assessment-Based Triage System for Emergency Department. Healthc Inform Res. 2020 Jan;26(1):13-19.

• Yu JY, Park,C. "Comparison Study of Graphical Models for Text Mining", Thesis (2017)

Publication (Under Revision)

• Hansol Chang, Jae Yong Yu (Co 1st Author), Geun Hyeong Lee, Sejin Heo, Se Uk Lee, Sung Yeon Hwang, Hee Yoon, Won Chul Cha, Tae Gun Shin, Min Seob Sim, Ik Joon Jo and Taerim Kim*. Clinical support system for triage based on federated learning and the Korea Triage and Acuity Scale. 2022, Scientific Reports (major revision).

Publication (Under Review)

• Jae Yong Yu, Do Yeop Kim, Sun Young Yoon, Gan Soo Han, Kyung Won Jeong, Rae Woong Park, Jun Myung Gwon, Feng Xie, Liu Nan, Marcus Eng Hock Ong, Yih Yng Ng, Hyung Jun Ju and Won Chul Cha. Inter-hospital Validation of Interpretable Machine Learning-based Triage Score for the Emergency Department using Common Data Model. 2022, Annals of Emergency Medicine.

• Jae Yong Yu, Han Sol Chang, Lin Xinyi, Feng Xie, Liu Nan, Sun Young Yoon, Marcus Eng Hock Ong, Yih Yng Ng, Michel Chia, Won Chul Cha*. Development and External Validation of Interpretable Partial Dependent Plot-based Triage Score for Emergency Departments. 2022, Scientific Reports

• Minjung Kathy Chae, Jae Yong Yu (Co 1st Author), Ju Hyung Ha, Woo Hyun Jung, Sung Yung Yoon, Won Chul Cha*. A time-adaptive machine-learning model to predict hemostatic intervention for suspected upper gastrointestinal bleeding patients in the emergency department. 2022, Annals of Emergency Medicine

Symposium Presentation

• Development and External Validation of Korean SERP (Score for Emergency Risk Prediction) using CDM (Common Data Model) for 3 hospitals in Korea (2022)

Main Author / The Korea Society of Emergency Medical Informatics

• External validation of the Score for Emergency Risk Prediction (SERP) an Interpretable Machine Learning-based Triage Score for the Emergency Department

Main Author / Pre-hospital & Emergency Research Center, Singapore (2022)

Development and Asian-wide validation of the Score for Interpretable Field Triage (SIFT) for predicting mortality in pre-hospital patients using the Pan-Asian Trauma

Outcomes Study (PATOS) (2022)

Main Author / Health Informatics Research

• Suggesting Critical Interventions for the Management of Patients in the Emergency Department With Potentially Severe Conditions (2021)

Main Author / Korea Society of Emergency Medicine

• Development and Visualization of a Multiclass Prediction Model for Preliminary Diagnosis at the Emergency Department Using Machine Learning / KOSMI 2020 (Poster)

• Difference of Emergency Department Frequent Users' Clinical Characteristics between Two Tertiary Teaching Hospitals in South Korea(2019)
Main Author / OHDSI Annual Symposium (Poster)

• Pattern Recognition of Clinical Outcome Using Hospital Encounter Data(2018)
Main Author / AMIA Annual Symposium (Poster)

• Machine Learning based Triage System in Emergency Department(2018)
Main Author / AMIA Annual Symposium (Poster)

• Experience of Common data model in NEDIS system(National Emergency Department Information System)(2018)
Co Author / KOSMI (Poster)

• Machine Learning based Triage System in Emergency Department(2018)
Main Author / KSEM(Oral)

Award

• Best Oral Presentation Award (SAIHSTer GREEN) ,2022, Samsung Advanced Institute for Health Sciences and Technology

• Best Oral Presentation Award,2021, Korea Society of Emergency Medicine

• SAIHST Best scientific paper, 2021, Samsung Advanced Institute for Health Sciences and Technology

• Oral Presentation Award, 2018, Samsung Advanced Institute for Health Sciences and Technology

- Digital Health Hackathon award, 2018, Samsung Medical Center

Lecture

University

• Ewha Women University Department of environmental engineering: R programming (2021.02)

• Konkuk University(KU) Career Master Camp: R programming (2020.01~2020.02)

•ChungNam National University(CNU) Computer Science : R programming (2018.01~2021.05)

•ChungNam National University(CNU) Library and Information Science: R programming (2019.11.01~2019.12.06)

• Kangwon National University(KNU): R programming (2020.07.19~2020.07.26)

• DaeDuck University: R programming (2019.12.19~ 2019.12.24)

Hospital

• Digital Smart and Health Office, Singapore : R studio Work shop (English Lecture) (2022.06)

• Tan Tock Seng Hospital : Statistics and R programming (English Lecture) (2021~2022)

• SeJong Hospital : Statistics and R programming (2022)

Company

• Fast Campus Statistics Camp : Statistics and R programming(2019~2021) / totally more than 200 people / Institution

• Body-Friend : R programming (2021.05.27 ~ 2021.08.05)

• GS shop : R programming for new employment (2019.03.19 ~ 2019.04.18)

• HDC Hyundai Development Company: R programming (2019.11.05~ 2019.11.12)

• Lotte Card: R programming (2019.10.18~ 2019.10.19)

Public Institution

• Korea Meteorological Center(KMC) : R programming (2018~2021)

• Korea Institute of Science and Technology Institute(KISTI) : R programming (2020.01~2021)

• The Korean Society of Emergency Medical Informatics: R programming (2021.04.26~)

• National Typoon center(NTC) : R programming (2019.08.05~2019.08.07)