

Anthony Li

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EDUCATION

M.D. Doctor of Medicine, Duke NUS Medical School Aug 2015 – Jun 2019

- Thesis: Application of Machine Learning to Acute Coronary Syndrome patients to predict reinfarction and mortality

B.Eng. Electrical Engineering, National University of Singapore Aug 2009 – Jun 2013

- Awarded First Class Honors (GPA: 4.5/5)
- Thesis: Automated Prostate MRI Segmentation [[Thesis link](#)]
- Relevant Courses: Advanced Control Systems, Computer Vision, Analytical Methods in ECE

MEDICAL EXPERIENCE

Medical Officer, Tan Tock Seng Hospital, Clinical Epidemiology Jan 2021 – Jun 2022

- Operated the following key daily surveillance systems: (1) Staff Acute Respiratory Infections. (2) Inpatient mortality. (3) Inpatient severe Dengue infections. (4) Inpatient and outpatient COVID-19 cases. (5) Emerging Infectious Disease horizon scanning.
- Supported the department's hospital COVID-19 Contact Tracing (CT) and Public Health (PH) operations over the Delta and Omicron waves: (1) Co-develop CT and PH SOP related to TTSH staff or patient having an equivocal or detected COVID-19 result from routine surveillance. (2) Initiate and coordinate CT and PH response. (3) Liaise with MOH on final CT list and subsequent PH action.
- Performed weekly generation of Singapore's national COVID-19 real time reproduction number using LSHTM's EpiNow2 model (non-stationary Gaussian process model). This number is currently used as part of TTSH's ICU resource usage forecast report.
- Performed research specialising in application of Artificial Intelligence and Machine Learning techniques to mortality and morbidity risk prediction for sepsis (n=39,029), COPD (n=2160) and vasculitis (n=447) patient populations. Pending publications can be found in research section of CV.
- Performed research on validation of Real Time Location System (RTLS) tags, compared to golden standard of direct observation, for purposes of hospital contact tracing.
- Supported the development of surveillance report templates in NHG's transition to EPIC electronic healthcare record.

Medical Officer, Sengkang General Hospital, General Medicine Oct 2020 – Dec 2021

- SKGH isolation and high risk acute respiratory infection wards: Took care of suspect and confirmed COVID-19 patients.

Medical Officer, Tan Tock Seng Hospital, Infectious Disease Service Jul 2020 – Sep 2020

- NCID and CDC outbreak wards during the COVID-19 pandemic outbreak: Took care of suspect and confirmed COVID-19 patients.
- NCID Infectious Disease clinics: Took care of HIV, Dengue, recovered COVID-19 and needle stick injury patients.
- TTSH main block: Assisted in replies to Infectious Disease blue letter referrals.

House Officer, Tan Tock Seng Hospital and Sengkang General Hospital Jul 2019 – Jun 2020

- General Surgery at SKGH: Performed Machine Learning research on application of UK NHS' National Early Warning System to 30,125 patients to guide hospital policy on CTSP.
- General Medicine at SKGH and TTSH: Developed automated temperature reminder compliance software for 60 medical staff of the General Medicine Department.

Research Medical Student, National Heart Center Singapore Sep 2017 – Jul 2019

- Performed research on predictive risk modelling for 3,885 Acute Coronary Syndrome (ACS) patients leveraging on ML methods such as XGBoost, MLP NN and LSTM RNN.
- Developed a novel method to improve ML model interpretability in ACS patients, thus identifying critical biomarkers (e.g. Creatinine, Total Cholesterol) for clinical intervention.

OTHER PROFESSIONAL EXPERIENCE

- Software Engineer**, Experimental Systems and Technology Lab Oct 2014 – Aug 2015
- Full stack development and deployment of applications for education under the Agile programming methodology. Technologies developed currently serves approximately 10,000 users.
- Senior Officer**, A*STAR, Science and Engineering Research Council Aug 2013 – Sep 2014
- Technology planning, grant administration and research management for Urban Systems Initiatives (S\$50 million grant), Satellite Initiatives and Infocomm Public Service Funding Research Projects.

RESEARCH PUBLICATIONS

Publications

- R. H. F. Lim, H. L. Htun, Anthony Li, H. L. Goh, W. M. Khyaw, A. H. Aung, B. Ang, A. Chow Fending off Delta – Hospital measures to reduce nosocomial transmission of COVID-19, *International Journal of Infectious Diseases* [[Paper link](#)]
- A. Chow, H. L. Goh, W. M. Kyaw, Anthony Li, R. H. F. Lim, B. Ang, Rostered routine testing for severe acute respiratory coronavirus virus 2 (SARS-CoV-2) infection among healthcare personnel—Is there a role in a tertiary-care hospital with enhanced infection prevention and control measures and robust sickness-surveillance systems?, *SHEA Journal: Infection Control & Hospital Epidemiology* [[Paper link](#)]
- D. W. Lim, H. L. Htun, Y. Wang, Anthony Li, W. M. Kyaw, L. T. Lee, A. Chow, Healthcare workers as 'canaries' for acute respiratory infections and pathogens during the COVID-19 pandemic, *The Journal of Hospital Infection* [[Paper link](#)]
- Sia S. X. Y., Anthony Li, Hierarchical Module Classification in Mixed Initiative Conversational Agent System, *27th ACM Conference on Information and Knowledge Management* [[Paper link](#)]
- Xiong W., Anthony Li, Ong S.H., Sun Y. Automatic 3D Prostate MRI Segmentation Using Graph Cuts and Level Sets, *Pacific-Rim Conference on Multimedia (PCM) 2013* [[Paper link](#)]

Abstracts

- Anthony Li, C. W. Oei, H. P. Phua, W. X. Lian, L. H. Htet, W. Y. Lim, Application of Machine Learning to predict 1 year All Cause Mortality in Chronic Obstructive Pulmonary Disease, *Singapore Health and Biomedical Conference 2021* [Oral Presentation / Poster] [Young Scientist Award - Merit]
- Anthony Li, T. M. Ng, A. Chow, Early identification of bacteremia and its predictors with high performing Artificial Intelligence models, *Singapore Health and Biomedical Conference 2021* [Abstract]
- Anthony Li, AO. Sahlen, Improving clinical interpretation of extreme gradient boosted ensemble tree models of cardiac data with high proportions of missingness, *Machine Learning for Healthcare 2018* [Oral Presentation / Poster] [[Paper link](#)]
- Anthony Li, AO. Sahlen, Superior prediction of outcome in ischemic heart disease with machine learning than regression modelling: importance of missing values, *Singapore Cardiology Society 30th Annual Scientific Meeting* [Oral Presentation]
- Anthony Li, Deshpande A., Sarraf-Yazdi S. Making meaning out of disorienting dilemmas, assumptions and emotions: a prelude to reflective write-ups, *International Consortium of Longitudinal Integrated Clerkship 2017* [Oral Presentation]
- Koong H. N., Bang D., Fung F. Y., Anthony Li A replay of our tutorials: A connection back to the soul of medical education, *International Consortium of Longitudinal Integrated Clerkship 2017* [Conference Workshop]

PROGRAMMING **Languages:** Python, R, C, C++, Ruby, Octave/Matlab, HTML5, Javascript, CSS, SQL
Deep Learning Frameworks: PyTorch, Tensorflow, Keras
Packages: SKLearn, XGBoost, SHAP, MICE, Caret, TidyR, EpiNow2
Tools: Git, Latex, RStudio, Docker, Google Analytics, Jupyter Notebook, Visual Code, Atom
Frameworks: Rails, Elasticsearch, Logstash, Kibana, JQuery, React, Flux