Tan Shih Jen

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Summary

Recognizing the rise in data creation and the critical role of data-driven decisions, I have honed my data literacy through analytics coursework at the National University of Singapore (NUS). Recently, I completed a part-time Master's degree in Biomedical Informatics, enhancing my healthcare analytics skills. I am passionate about extracting insights from medical data to improve patient care and operational efficiency. With a solid foundation in analytical methods and expertise in machine learning, data visualization, and natural language processing, I am well-positioned to drive innovation in healthcare. I bring eight years of hands-on laboratory experience in chemistry, biochemistry, and microbiology, with substantial experience managing lab operations, funding, and safety protocols. My Biochemistry degree has provided me with a deep understanding of biological and healthcare contexts, further strengthening my ability to contribute effectively to healthcare analytics.

Education

National University of Singapore

Master of Science - Biomedical Informatics (Analytics Specialisation)
August 2022 - June 2024
GPA: 4.15 / 5.00

Capstone Project: Early Detection of Non-alcoholic Fatty Liver Disease (NAFLD)-Associated Hepatocellular Carcinoma (HCC) by Machine Learning
Project Advisor: Dr. James Lee Wai Kit

University Putra Malaysia

Bachelor of Science (Honors) - Biochemistry
September 2011 - June 2015
GPA: 3.95 / 4.00

Final Year Project: Evaluation of banana (*Musa* sp.) flowers of selected varieties for their antioxidative and anti-hyperglycemic potentials
Project Advisor: Dr. Nazrim Marikkar

Certification & Professional Development

- CITI Health Information Privacy and Security (HIPS) | CITI Program
- AICP Python for Artificial Intelligence and Machine Learning | National University of Singapore
- Data Literacy Programme (DLP) - Advanced: Survey Analytics | National University of Singapore
- Artificial Intelligence Competency Course (Intermediate) | National University of Singapore
- Data Literacy Programme (DLP) - Intermediate: Applied Regression Models using R | National University of Singapore
- Data Literacy Programme (DLP) - Intermediate: Customer Analytics | National University of Singapore
- Professional Certificate in Basic Artificial Intelligence and Machine Learning | National University of Singapore
- Data Visualization Begins With Me | National University of Singapore
- Database Creation, Manipulation, and Querying with SQL | National University of Singapore
- Artificial Intelligence Competency Course (Foundation) | National University of Singapore
- Python Programming | National University of Singapore
- Data Literacy Programme (DLP) - Basic | National University of Singapore

Experience & Key Deliverables

Laboratory Technologist (Jan 2019 - Present)
Department of Microbiology & Immunology, Yong Loo Lin School of Medicine, National University of Singapore (NUS)
Singapore

- Lead a team of laboratory technologists for undergraduate practical classes in LSM3232 Microbiology (Practical 1-3) and LSM3225 Molecular Microbiology in Human Diseases (Practical 4), providing technical and logistical support to faculty, instructors, and teaching assistants.
- Support Assistant Professor Dr. Chris Sham Lok-To in managing research grants with an operating budget of over $5 million by overseeing budget allocation, tracking expenditures, and preparing financial reports.
- Serve as the safety lead in Assistant Professor Chris Sham Lok-To's laboratory, conducting safety induction training for new students and staff before they commence their projects. Trained 33 staff and students to date, maintaining a record of zero accidents/incidents in the lab.
- Prepare, review, and maintain Standard Operating Procedures (SOP) and Risk Assessments (RA) for the PI research lab and department core facilities, reviewing and maintaining a total of 57 SOPs and RAs.
- Implement and monitor laboratory safety practices, ensuring compliance with University and national regulations, resulting in consistently positive results during unannounced safety inspections with no areas for improvement identified. Earned the departmental lab safety award in 2022 for outstanding safety performance.
- Oversee equipment and fixed asset management, coordinating with vendors to acquire fixed assets via ITQ and ITT processes. Collaborate with the University Fixed Asset Management Unit (FAMU) for annual fixed asset verification, maintain servicing records, and coordinate with service engineers for equipment preventive maintenance and repairs.
- Oversee license applications and renewals. Hold a valid N2 license issued by the National Environment Agency (NEA) to house imaging equipment with a Class 3B laser in the Department of Microbiology and Immunology. Liaise with third-party agents for import permit applications for shipping biological materials into Singapore.
- Manage Department core facilities, including the BioImaging Room, Bacterial Culture Laboratory, Liquid Nitrogen Cold Storage, and Zoom HT Plate Washer, assisting researchers with access and coordinating between researchers and technical specialists.

Research Assistant (Sep 2015 - Jan 2018)
Laboratory of Natural Products, Institute of Bioscience, University Putra Malaysia (UPM)
Selangor, Malaysia

- Conducted metabolomics study on natural products. First author of a review paper and co-author of a research paper.
- Wrote a research proposal and assisted in the grant application process, successfully securing the Putra Grant (Geran Putra Berimpak), an internal research grant amounting to RM50,000.00.
- Ensured proper maintenance and management of the husbandry and animal facility.
- Managed procurement tasks, including sourcing and purchasing laboratory supplies.

QA/AC Intern (Jun 2014 - Aug 2014)
Rida Fruits Sdn Bhd
Batu Pahat, Johor, Malaysia

- Performed QC inspection and routine laboratory tests of incoming raw materials, intermediate products, packaging, and finished goods with established sampling and testing protocols.
- Prepared QA and QC reports.
- Performed sensory evaluation on raw materials and finished products.
- Executed food safety standards in compliance with HACCP and HALAL requirements.

IT Literacy

- **Machine Learning.** Completed end-to-end machine learning projects during MSc program, including developing and evaluating models for early detection of NAFLD-associated hepatocellular carcinoma and acute kidney failure risk prediction in ICU patients. Proficient in data visulization, data wrangling, preprocessing, feature selection, hyperparameter tuning, and model evaluation using Pandas, NumPy, Matplotlib, Seaborn, Plotly, and Scikit-Learn libraries.
- **Medical Data Processing.** Queried data from NUHS Discovery AI datamart using SQL. Utilized USAGI for initial mapping to OMOP standard codes (SNOMED CT, RxNorm, LOINC, etc.).
- **Natural Language Processing.** Proficient in using tools such as NLTK, spaCy, Gensim, and TextBlob to perform NLP tasks including text normalization, text classification, and sentiment analysis.
- **Multivariate Data Analysis.** Experienced in using SIMCA and Chenomx for NMR-based metabolomics studies, applying multivariate techniques to analyze complex data and uncover insights from metabolic profiles.
- **Statistical Analysis.** Experienced in using Jamovi, R programming, and SciPy to perform statistical analyses.
- **Python Programming.** Developed a Python web application to automate tracking and recording of oligomer and sequencing service usage in a research laboratory. The application extracts unstructured data from invoices and uploads it to Google Sheets for streamlined record-keeping.
- **HTML & CSS.** Created a static website using HTML and CSS to showcase lab research activities. The site provides comprehensive details on research scope, publications, lab members, and events, ensuring up-to-date public access to the lab's work.
- **Dashboards.** Developed interactive dashboards using Streamlit and Power BI to monitor and manage research funding and expenses in the laboratory.
- **Digital Content Creation.** Designed bi-monthly laboratory safety infographic posters using Canva and Adobe Illustrator. Created presentation slides for the Head of Department for the annual Department Safety and Training Day, and developed website banners, event banners, and flyers for educational seminars.
- **Generative AI.** Leveraged retrieval-augmented generation (RAG) techniques with open-source large language models like Llama-3 to develop a laboratory safety chatbot.

Publications

- Chong SG, Ismail IS, Ahmad Azam A, **Tan SJ**, Shaari K, Tan JK. Nuclear magnetic resonance spectroscopy and liquid chromatography-mass spectrometry metabolomics studies on non-organic soybeans versus organic soybeans (*Glycine max*), and their fermentation by *Rhizopus oligosporus*. J Sci Food Agric. 2023;103(6):3146-3156. doi:10.1002/jsfa.12355
- **Tan SJ**, Ismail IS. Potency of Selected Berries, Grapes, and Citrus Fruit as Neuroprotective Agents. Evid Based Complement Alternat Med. 2020;2020:3582947. Published 2020 May 30. doi:10.1155/2020/3582947
- Marikkar, Nazrim & **Tan, S.J.** & Salleh, A. & Azlan, Azrina & Shukri, M.A.M.. (2016). Evaluation of banana (*Musa* sp.) flowers of selected varieties for their antioxidative and anti-hyperglycemic potentials. 23. 1988-1995.