

Ryann Sim Wei Jian

ENGINEERING SYSTEMS AND DESIGN

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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Profile

I am a third year Ph.D. student at SUTD in the Engineering Systems and Design pillar, with a particular research interest in learning in games. Through research and industry experience, I am looking to utilize game theory, optimization and economics to better understand the mechanisms of real-life processes and networks.

Education

Singapore University of Technology and Design

PH.D., ENGINEERING SYSTEMS AND DESIGN

Singapore

Sep. 2019 - Exp. Sep 2023

- Awarded SUTD President's Graduate Fellowship

Singapore University of Technology and Design

B.E., ENGINEERING SYSTEMS AND DESIGN (SUMMA CUM LAUDE)

Singapore

May 2016 - Aug. 2019

- Awarded Wilmar Scholarship
- Focus Track : Operations Research

Publications

- [1] Stratis Skoulakis, Tanner Fiez, Ryann Sim, Georgios Piliouras, and Lillian Ratliff. Evolutionary game theory squared: Evolving agents in endogenously evolving zero-sum games. In *AAAI Conference on Artificial Intelligence*, 2021.
- [2] Tanner Fiez, Ryann Sim, Stratis Skoulakis, Georgios Piliouras, and Lillian Ratliff. Online learning in periodic zero-sum games. *Advances in Neural Information Processing Systems*, 34, 2021.
- [3] Ryann Sim, Stratis Skoulakis, Lillian J Ratliff, and Georgios Piliouras. Fast convergence of Optimistic Gradient Ascent in network zero-sum extensive form games. In *International Symposium on Algorithmic Game Theory*. Springer, 2022.
- [4] Georgios Piliouras, Ryann Sim, and Stratis Skoulakis. Beyond time-average convergence: Near-optimal uncoupled online learning via Clairvoyant Multiplicative Weights Update. *arXiv preprint arXiv:2111.14737*, 2021.
- [5] Georgios Piliouras, Rahul Jain, and Ryann Sim. Matrix Multiplicative Weights Updates in quantum zero-sum games: Conservation laws & recurrence. Submitted to NeurIPS 2022.
- [6] Wayne Lin, Georgios Piliouras, Ryann Sim, and Antonios Varvitsiotis. Game dynamics and quantum bilinear optimization. Submitted to NeurIPS 2022.

Undergraduate Research Experience

Data Driven Robust Portfolio Optimization

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM, SUTD

Singapore

Jan. 2019 - Sep. 2019

- The project uses asset returns data to create a robust portfolio optimization model that performs better than the standard minimum-variance portfolio.

Predicting Driver State & Environment with LSTM

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM, SUTD

Singapore

Jan. 2018 - Jul. 2018

- Extending upon previous work done on binary classification of 6-second epochs of driver micro-glances, we sought to explore categorical classification using RNN and LSTM. We also explored vector embedding to convert macro glances into vector-based interpretations.

Augmented Human (Asian Leadership Program)

INTERNATIONAL DESIGN CENTER, ZHEJIANG UNIVERSITY

Hangzhou, China

Sep. 2016 - Mar. 2017

- Designed an indoor navigation API called JANUS using Android Studio and Python that shows the path to an indoor destination as an augmented reality display on users' mobile phones.

Autonomous Unmanned Aerial Vehicle with Innovative Obstacle

Avoidance and Operation in Low Light Conditions (SAFMC)

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM, SUTD

Singapore

Sep. 2016 - Mar. 2017

- Created a semi-autonomous drone with proprietary GPS navigation and high structural strength. Used the drone in the Singapore Amazing Flying Machine Competition 2017.

Professional Experience

British Petroleum Singapore

CORE DATA STRATEGY INTERN

Singapore

May 2018 - Aug. 2018

- Implemented quarterly charts, navigation widgets and bug fixes in Python and HTML for a price dashboard used by traders globally.
- Developed and deployed an easy-to-use Python module that allows shiptrackers to perform logical checks on multi-source information, and create their own checks if required. Currently used across three benches in BP Singapore.

British Petroleum Business Service Centre Malaysia

MASTER DATA MANAGEMENT INTERN

Kuala Lumpur, Malaysia

Nov. 2015 - Mar. 2016

- Organized HR records for over 300 employees working in the Business Service Centre using Excel VBA.

Teaching Experience

Teaching Assistant, 40.012 Manufacturing and Service Operations

ENGINEERING SYSTEMS AND DESIGN, SUTD

Singapore

Spring 2021

- Ran tutorial sessions and organized project meeting sessions.

Teaching Assistant, 40.015 Simulation Modeling and Analysis

ENGINEERING SYSTEMS AND DESIGN, SUTD

Singapore

Fall 2020

- Ran tutorial sessions and provided project mentorship.

Teaching Assistant, 40.014 Engineering Systems Architecture

ENGINEERING SYSTEMS AND DESIGN, SUTD

Singapore

Spring 2019

- Helped students during office hours, helping improve their skills in Capella and R.
- Mentored students for their respective final projects, which involved designing an educational game using systems design rules.

Instructor, Introduction to \LaTeX

INDEPENDENT ACTIVITY PERIOD, SUTD

Singapore

21 Jan. 2019

- Helped create material and teach a class to help 35 participants learn how to use \LaTeX in their research and coursework.

Teaching Assistant, 10.004 Advanced Mathematics II

CLUSTER OF SCIENCE AND MATH, SUTD

Singapore

Fall 2018

- Guided first-year students in the course, which focused on Multi-variable Calculus and Ordinary Differential Equations

Instructor, Freshmore Learning Hub

Singapore

SCIENCE AND MATH CLUSTER, SUTD

Fall 2018

- Taught various topics in Multi-variable Calculus and Ordinary Differential Equations, in supplement to the material taught in 10.004.

Teaching Assistant, 10.007 Modelling the Systems World

Singapore

SCIENCE AND MATH CLUSTER, SUTD

Spring 2018

- Guided first year students in course material that spanned various topics in Systems Modelling and Systems Optimization.
- Held review sessions before exams and ran a \LaTeX workshop to help students prepare for report submissions.

Teaching Assistant, 3.007 Introduction to Design

Singapore

SCIENCE AND MATH CLUSTER, SUTD

Fall 2017

- Mentored first-year students while they were designing their respective products, with a focus on design thinking.

Teaching Assistant, 10.001 Advanced Mathematics I (BootCamp)

Singapore

SCIENCE AND MATH CLUSTER, SUTD

Summer 2017

- Assisted students who had previously failed the course, helping them understand concepts in Differentiation and Integration.
- Graded homework assignments to ensure students understood material and stayed on track.

Instructor, Introduction to HTML and CSS

Singapore

INDEPENDENT ACTIVITY PERIOD, SUTD

9 Jan. 2017

- Helped instruct a class that sought to help participants learn how to create their own website.

Honors & Awards

2019	President's Graduate Fellowship , SUTD	Singapore
2019	Meritorious Winner , COMAP Interdisciplinary Contest in Modeling (ICM) Problem D	Singapore
2017	Best Video Award, 1st Position , Singapore Amazing Flying Machine Competition 2017 (Category D Semi-Autonomous)	Singapore
2016	Math II Honors Class (Linear Algebra) , Faculty of Science and Math	Singapore
2016	Wilmar Scholarship , Wilmar International	Singapore

Extracurricular Activities

SUTD Graduate Student Association (GSA)

Singapore

VICE-PRESIDENT

Mar. 2020 - Present

- Helped plan and implement several events, including 3 Minute Thesis and Graduate Student Matriculation Afterparty.

SUTD Student Government (ROOT)

Singapore

DEPUTY VICE-PRESIDENT OF COMMUNICATIONS

Sep. 2017 - Sep. 2018

- Led a team of 11 members to make student life in SUTD more fulfilling by acting as a bridge between the student body and management.
- Founded a team made of passionate individuals to change SUTD culture in collaboration with the Lee Kuan Yew Centre for Innovative Cities.
- Created a website for the student government, which provides information and resources to the student body.

'Into the G.R.I.D.' Orientation Committee

Singapore

DEPUTY PROGRAMS DIRECTOR

Sep. 2016 - May 2017

- Organized and executed an Orientation camp for 450 freshmen in order to promote integration among students.
- Designed a 3 day itinerary with innovative and fun activities for all students. Novel technologies were used, such as Python scheduling to release clues for a treasure hunt.

SUTD Choir

Singapore

PRESIDENT

Nov. 2016 - Nov. 2017

- Led the choir in expanding our repertoire, with a particular focus on vocal technique.
- Participated in various concerts and performances in Singapore, including a performance at the Esplanade.

SUTD Vocomotives

Singapore

MUSIC DIRECTOR

Nov. 2016 - Nov. 2017

- Held training sessions twice a week to help the acapella group members improve vocal technique.

SUTD University Ambassadors

Singapore

MEMBER

Jun. 2016 - Present

- Took part in various Acceptance Tea events, where I served as a campus guide and student ambassador.
- Emcee and student helper for SUTD Open House 2018.

Languages and Skills

Programming

Proficient in Python, R, \LaTeX , SQL, HTML and CSS

Intermediate in JavaScript, Mathematica, MATLAB, AMPL, VBA and PyTorch

Tools/Software

Proficient in Microsoft Office, Adobe Premiere Pro and Adobe After Effects

Intermediate in Tableau, Adobe Illustrator and Unity

Languages

Fluent in English, Mandarin and Malay (written and spoken)

Hobbies

Reading poetry, cooking, playing tabletop role-playing games and watching/analyzing films