

# JAMES RAPHAEL TIOVALEN

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## EDUCATION

### Singapore University of Technology and Design (SUTD)

- Bachelor of Engineering (Information Systems Technology and Design), Honours
- Preferred Focus Track: Artificial Intelligence
- Cumulative GPA: 4.70/5.00 (Expected Honours with Highest Distinction)
- Expected Date of Graduation: August 2022

Singapore  
May 19 to Present

## ACADEMIC PROJECTS & SELF-INITIATED PROJECTS

### SUTDoggo

#### Project Leader

- Leading a project team in building a Stanford Doggo with a stretch goal of implementing autonomous navigation for the Doggo.
- Developing a custom software stack for the robot by improving the original project codebase and integrating ROS into the navigation stack.

Singapore  
Sep 19 to Present

### Singapore University of Technology and Design

#### Smart Classroom, Software Engineer

- Developed a software-based method to monitor attention rate in virtual classrooms by using Zoom's livestream API, gaze tracking, head pose estimation and sentiment analysis.

Singapore  
May 20 to Dec 20

### DiscoverSUTD 2020 Website

#### Chief Developer

- Developed a one-stop website for the incoming SUTD Freshmores (Class of 2024) as part of the DiscoverSUTD programme. Utilized HTML, CSS and JavaScript to design a beautiful and simple website to embed all the information needed by the Freshmores to have a meaningful introductory 3-weeks in SUTD.

Singapore  
May 20 to Sep 20

### SUTD Orientation 2020 Website

#### Main Developer

- Developed a website for SUTD Orientation 2020. Utilized Vue.js framework for its relatively small footprint and TypeScript for static typing.

Singapore  
Jan 20 to Sep 20

### Hostel Hunt Bot

#### Main Developer

- Developed a Telegram Bot in Python for SUTD Hostel Hunt. Utilized Cloud Firestore for database management and Heroku for cloud deployment.

Singapore  
Dec 19 to Feb 20

### Olethros Bot

#### Chief Developer

- Developed a Telegram Bot in Python with miscellaneous commands for my SUTD Freshmore Class. Utilized MongoDB Atlas for database management and Microsoft Azure for cloud deployment.

Singapore  
Sep 19 to May 20

### Singapore University of Technology and Design

#### V2X Implementations, Team Coordinator & Software Specialist

- Coordinated a team of 4 in studying and implementing the applications of V2X devices in real-life vehicles.

Singapore  
Sep 19 to May 20

### SUTD What The Hack Slack Bot

#### Chief Developer

- Developed a Slack Bot in Python to streamline and automate the judging process for SUTD's What The Hack hackathon. Utilized FastAPI for speedy asynchronous service, SQLAlchemy ORM for secure database management, Cloud Firestore for user-bot conversation state management and AWS for cloud deployment.
- As Technical Director, headed the Automation Team in developing automation tools such as an automated form-email workflow and a backend dashboard for What The Hack's Organizing Committee.

Singapore  
Sep 19 to Feb 20

### OpenSUTD Landing Page

#### Main Developer

- Developed the landing page for OpenSUTD, an open-source movement dedicated to build a community in SUTD that embraces open sharing and collaboration. Utilized HTML, CSS and JavaScript to achieve a clean and elegant look for the webpage.

Singapore  
Sep 19 to Oct 19

### Linorobot

#### Team Leader

- Led a team of 10 in building a working 7kg Linorobot with dimensions 300x215x102mm, equipped with a ROS autonomous navigation stack, teleoperation and SLAM.
- Took down and maintained detailed professional documentation on GitHub.

Singapore  
May 19 to Jul 19

**The Spread Bot**  
**Chief Developer**

**Singapore**  
**Mar 19 to Sep 19**

- Developed a Telegram Bot in Python for The Spread, a café/food bar in NUS Business School, with order and payment capabilities. Utilized PostgreSQL for database management and Heroku for cloud deployment.

**WhiteHacks@SG**  
**Team Leader**

**Singapore**  
**Feb 18**

- Participated in a 2-day cybersecurity workshop and penetration-testing competition.
- Managed to be in the top 10 out of about 50 groups (Team //TODO).

**Energy Innovation Challenge**  
**Team Leader**

**Singapore**  
**May 17 to Jul 17**

- Designed a solar thermophotovoltaic cell prototype as a proof of concept.
- Increased the efficiency and power output of a solar PV cell by about 15% by retrofitting thermoelectric cells to the cell's posterior.

**Arduino Weather Station Workshop Competition**  
**Software Developer**

**Singapore**  
**Mar 17**

- Assembled a weather station as a team of 3 from the provided components and wrote Arduino code for data collection.
- Obtained 12<sup>th</sup> place in terms of accuracy of the data collection of weather conditions around the venue.

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**CO-CURRICULAR ACTIVITIES**

**SUTD Organisation of Autonomous Robotics**  
**Vice-President**

**Singapore**  
**Jun 19 to Jan 21**

- Led the organization of about 70 people strong together with the President with the objective of nurturing a committed robotics community by building skills to take on industry projects.
- Supervised the day-to-day operation and directed the culture, vision and mission of the club.
- Assisted the President in delegating work amongst an Executive Committee of 7 individuals.
- Worked closely with the Secretary in settling administrative matters of the club.
- Monitored the logistics flow and manned MOMObot, an autonomous ground vehicle, for Singapore Maker Extravaganza 2019, an external event at which SOAR showcased our club projects.
- Assumed the position of Logistics IC for SUTD BuildSomething 2019, a week-long SolidWorks & Arduino workshop course held in collaboration with SUTD Entrepreneurship Centre, with the end product of a line-tracing robot.
- Manned Jessica, a robot barista, at Singapore MINDEF Innovation Symposium 2019, which was held at SUTD, to serve coffee for about 50 personnel.
- Improved the skills and proficiencies of about 30 members of the club by organizing and facilitating 7 workshops that cover robotics and other technical concepts (SolidWorks, Arduino, PID, Git, Linux, ROS and Robotic Arm).
- Developed a fresh and responsive website for the club by utilising Vue.js and TypeScript.
- Worked together in a team of 10 as the organising committee to build a fully autonomous arena for SUTD's biggest robotics competition, Roboclash, by developing a novel scoring system utilising computer vision (OpenCV) and IoT sensors.

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**WORK EXPERIENCES**

**Temasek Laboratories @ SUTD**  
**Research Assistant**

**Singapore**  
**May 20 to Sep 20**

- Worked under the supervision of Professor Malika Meghjani to develop an intelligent multi-robot system capable of responding dynamically to emergency scenarios.
- Developed an algorithm based on model predictive control to automate multiple robots in navigating around dynamic obstacles in a Gazebo simulation.

**Mathvision Enrichment Centre Pte. Ltd.**  
**Assistant Teacher**

**Singapore**  
**Mar 19 to May 19**

- Taught Physics for the IB (SL and HL), Singapore-Cambridge GCE A-Level (H2), AT (Computational), EDEXCEL AS Level, EDEXCEL International GCSE (9-1) - Science Double Award, SAT and Cambridge IGCSE (Pure and Co-Science) syllabi.
- Taught Mathematics for the IGCSE - CIM (Core and Extended) and UKMT (JMC) syllabi.
- Rated by **75%** of students taught as **Excellent** and by **22%** of students taught as **Good**. The other 3% did not submit a rating.
- Had mastery of the content and ability to explain clearly and patiently.

## ADDITIONAL INFORMATION

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- Technical Skills:
  - Python
  - C/C++
  - ROS
  - JavaScript/TypeScript
  - Java
  - SQL
  - SolidWorks
  - Arduino
  - Android
  - HTML/CSS
  - Visual Basic
  - MATLAB
  - LaTeX
  - Linux
  
- Language Proficiency:
  - English
  - Indonesian
  
- Interests:
  - Full-Stack Development
  - Robotics
  - Design Thinking
  - Teaching