

Aarush Garg

German Swiss International School, Hong Kong

Mobile no: +852 6110 4698; Email: gargaarush2006@gmail.com

Education

German Swiss International School, Hong Kong

2016-Present

International Baccalaureate Diploma Program IBDP, Grade 12

2023-Present

- ◆ IB HL Subjects (Mathematics: Analysis and Approaches (AA), Chemistry, Physics)
- ◆ IB SL Subjects (Geography, German B, English Language and Literature)
- ◆ IB Predicted Grade: 45/45

Cambridge IGCSE Board Examinations, Grade 10

2021-2023

- ◆ IGCSE Results: 10 A* and 1 A (June 2023)
- ◆ AS German: Grade A (top grade)

Speaking Proficiency

2023-2024

- ◆ Deutsch Sprachdiplom 2 (DSD 2) Examination: C1 Level Proficiency in German
- ◆ HSK Level 4 examination: Working Level Proficiency in China

Standardized Tests

SAT Score 1570/1600

2024

- ◆ Mathematics: 800/800
- ◆ Evidence Based Reading and Writing: 770/800

Academic Honors and Awards

- ◆ Awarded **SCMP Student of the Year Finalist** for Sustainable Advocate (Top 12 in Hong Kong) 2024
- ◆ British Mathematical Olympiad-1 (BMO-1) **Distinction, (Top 200 out of 50,000+)** 2023
- ◆ **Hong Kong Outstanding Students (HKOSA) Award: (Top 20 out of 1000+)** 2022
- ◆ **3X invitee** to the American International Mathematical Exam (**AIME**), (top 5% in AMC10) 2024
- ◆ **2 Silver Medals** in **UKMT Hamilton and Cayley Olympiad** (top 50 out of 80,000+) 2022
- ◆ **CREST GOLD Award** by British Science Association for BIPV algorithm 2024
- ◆ HKAGE Got Talent Award to represent HKAGE in International Science Competitions 2024
- ◆ **Rensselaer Medal** for Outstanding Academic Achievement in Mathematics and Science 2024
- ◆ **Academic Excellence Awards** at GSIS: Year 10, Year 12 2022, 2024
- ◆ World Mathematics Championship Finals (top 10 participants) – **2 silver, and 1 bronze medal** 2024
- ◆ Remotely Operated Underwater Vehicle (ROV) MATE – **Winner of Flying Fish Award** 2023

Experience: Engineering Research and Publications

Internship at City University of Hong Kong

Sep 2023 - Current

- ◆ For the last **14 months**, working as the **youngest member** of a 5-member team of PhD Students
- ◆ Developed a **Genetic Algorithm** to optimize **Building Integrated Photovoltaics (BIPV)**
- ◆ Maximizing Power Conversion Efficiency (PCE) with input constraints like VLT (Visible Light Transmission), IRR (Infrared Radiation Rejection), and CIE (Color Luminosity)
- ◆ Awarded **CREST GOLD** Certificate for this Research by British Science Association
- ◆ Invited to present the findings in the **IEEE Young Engineers Conference** in Hong Kong
- ◆ Launched a **start-up**; Engaging with producers of BIPV film; Potential to increase renewable energy to **5.5%** of Hong Kong's total electricity consumption

Internship at Hong Kong University of Science and Technology (HKUST)

2022

- ◆ **Research Paper** - "Forecasting Solar Power Output to integrate solar energy into the power grid"
- ◆ Collected real-time data from the HKUST Supersite for weather features like Azimuth, windspeed, Solar Irradiance and the power output from the HKUST Test Solar panel
- ◆ **6%** error rate for 1-hour ahead forecast; **10%** error rate for 14-hour ahead forecast
- ◆ Fine-tuned and compared results achieved with **Machine Learning** techniques:
- ◆ Convolutional Neural Networks – Long Short-Term Memory (**CNN-LSTM**), **CNN**, and **RNN**
- ◆ **Paper Published in SSRN:** https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4398707

- Research under Professor Benoit Legat (MIT) - Cambridge Centre for International Research** 2022
- ◆ **Research Paper** - “Policy Making for Oil Imports using Mixed Integer Linear Programming Approach”
 - ◆ Multi-objective optimization of whole set of **UN countries** to reduce the cost and pollution of oil transfer
 - ◆ Used **Mixed Integer Linear Programming** techniques and the HiGHS Optimizer in Julia JuMP
 - ◆ **Paper Published in SSRN:** https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4382123

- Research at Indian Institute of Technology, Bombay (IIT Bombay)** 2023
- ◆ Mixed Integer Programming (MIP) to solve **Periodic Event Scheduling Problems (PESP)**
 - ◆ Worked under the guidance of **Professor Narayan Rangaraj of IIT Bombay (IEOR)** to learn techniques of linear optimization with a focus on PESP.
 - ◆ Used **Linear Programming and Big M** formulation to optimize train rack demand for Jindal Steel India.

Mathematics and Summer Courses

- ◆ **Euler’s Circle** – USA under **Dr. Simon Rubinstein-Salzedo** 2023
- ◆ Program in Algorithmic and Combinatorial Thinking under **UPenn Prof. Rajiv Gandhi** 2023
- ◆ **Stanford University:** Multivariate Differential Calculus 3-credit Course (**Top Grade: A**) 2022
- ◆ **Hong Kong University:** Mathematical Modelling 6-credit Course (**Grade: A+**) 2022
- ◆ **Stanford University / Coursera:** Achieved 98.03% in Online Machine Learning course 2021

Sustainability Pursuits and Community Outreach

- ◆ Appointed Student Environmental Protection Ambassador (SEPA) by **Hong Kong Government** 2024
- ◆ Awarded Student Environmental Protection Ambassador **Gold Outstanding SEPA Award** 2024
- ◆ **Founder and Head** of GSIS Sustainability Development Society 2023-Present
- ◆ Appointed **UNITAR Youth Ambassador** after 8 week training course on UN SDGs 2022
- ◆ **Team Leader** of **Clean Air Network** Events Committee and helped to create Clean Air Conference 2022
- ◆ **Hong Kong Youth Summit** 2023
 - ⇒ Organized the Hong Kong Youth Summit as part of the Hong Kong Outstanding Students’ Association with Keynote Speakers like Sun Dong, Secretary of Technological Innovation
- ◆ **Action Week** as the leader of the school’s Sustainable Development Society 2024
 - ⇒ Organized a waste recycling program in collaboration with the **Hong Kong Government Environmental Protection Department**; 200+ kg of recycled waste.

Leadership Initiatives

- ◆ **School Prefect** for Year 12 and 13 (German Swiss International School) Sept 2023-Present
- ◆ **Head of Academic Mentorship Program** (German Swiss International School) Sept 2023-Present
- ◆ **Financial Secretary** of the Hong Kong Outstanding Students’ Association (HKOSA) 2022-2023
 - ⇒ Managed the finances of HKOSA Association for full financial year, **raising HK\$40,000**
- ◆ **Model United Nations (MUN) - Chairing DISEC** at RENMUN and chairing NATO at GSISMUN 2022-2023
- ◆ **Battle of the Books** (First time in 15 years) **Winning Team Coach** (German Swiss International School) 2021-2022

Cricket Achievements (International and National)

- ◆ Represented **Hong Kong Under-19 Cricket team** in the **ICC Cricket U19 World Cup Qualifiers** 2022
- ◆ Selected for the Hong Kong Under 19 Cricket Squad for the ACC Cricket Asia Cup Qualifiers 2023
- ◆ **Founder** of the Secondary School Cricket Team at GSIS 2023-Present
- ◆ **Record Holder** for taking 8 wickets (out of maximum 10) in Hong Kong 2022

Extra-curricular Achievements

- ◆ Scuba Diving – PADI Specialty Diver Certification 2023
- ◆ Model United Nations – Honorable Mentions in many conferences (HKMUN, CISMUN, VSAMUN) 2022-2023
- ◆ Member of the HKAGE (Hong Kong Academic for Gifted Education) 2022-Present
- ◆ Representing GSIS Hockey Team and **won the HKSSF Hockey Division 1 League** 2021-2022

Programming Languages

Python, Julia JuMP, Matlab, Octave, Arduino, JavaScript, Tensorflow, Keras, Sci-kit learn