

# ARAV KAUL

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## EDUCATION

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### Dhirubhai Ambani International School

Mumbai, India

*IB Diploma Programme — 4.00 GPA — Predicted 45/45*

*Class of 2026*

- HL Physics, Economics, Mathematics AA; SL Chemistry, English Lang & Lit, Spanish B.
- SAT 1580 (800 Math, 780 EBRW).

## SELECT HONORS & DISTINCTIONS

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**Bal Puraskar Nominee** — Government of India state nomination for Project Zūl (India's highest civilian honor for children).

**Purple Comet! (Math) & Avogadro (Chem)** — Ranked **1<sup>st</sup>** worldwide in both (4,500+; 7,000+).

**Sir Isaac Newton Physics Contest** — Distinction; Rank **62/5,873** (~top 1%).

**Academic awards:** Honor Roll (*11 A\* IGCSE*); School Topper *Physics 98%, Chemistry 97%*; Academic Excellence (*Y9, Y11*); School Citizenship *top 3%*; Outstanding Learner *top 4.5%*.

## LEADERSHIP & ENTREPRENEURSHIP

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### Project Zūl — Grassroots STEM Initiative

2024–Present

*Founder*

*J&K → Pan-India*

- Built and piloted an Arduino-based curriculum tailored for low-resource labs; equipped **15+** rural schools, taught **1,000+** students, and distributed **500** kits using **US\$1,000** raised from community donors.
- Trained **15** teachers and handed off materials via a district MoE channel so the program persists sustainably; the model is expanding to **3** states and has **12** media features including recognition by the J&K Ex-Min. of Education and the Lt. Governor.

### Project Pivot — AI Boxing App

2024–Present

*Founder & Lead Engineer*

*Mumbai, India*

- Shipped a smartphone-only, real-time coach that runs MediaPipe/ONNX/TFLite in <40ms at **94%** pose accuracy, so first-time boxers get instant, safe form cues without hardware.
- Deployed across **20** under-resourced gyms and **5** private/residential centers (**100+** unique users) through a partnership with Grassroots Boxing Academy (**70** coaches), cutting effective coaching costs by **85%**.

### MPact Glove — Smart Wearable for Boxing

2024–Present

*Founder & Lead Engineer*

*Mumbai, India*

- Designed a BLE glove with FSR/IMU sensing and on-device Butterworth filtering; punch force/velocity estimates reach  $\approx 92\%$  accuracy in bench tests using instrumented bag data.
- Retail bill is **US\$45** (vs **US\$1,150** incumbents), and firmware flags risky wrist angles to reduce injury.

### Good As New — E-commerce Startup

2021–2023

*Co-Founder, CEO & CTO*

*Mumbai, India*

- Grew a laptop-care kit line to **US\$10,000** in six months at **35%** net margin by switching to mailer-box packaging and renegotiating plastics; COGS fell **15%** and on-time delivery held at **98%**.

### Independent Tutoring

2022–Present

*Founder & Lead Instructor*

*Remote / Mumbai*

- Ran a small tutoring practice (**US\$2,300**) using gap-analysis diagnostics and past-paper trackers; **25** students across **3** schools earned A–A\*.
- Published a public notes bank with **100+** weekly visitors, covering 11 subjects offered by CIE IGCSE.

## RESEARCH, EXPERIENCE & JOURNALISM

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### Machine-Learning Nuclear Structure — Research Intern & Co-author 2024–2025

- Worked with a Marie Curie Postdoc (GANIL, France) to model  $B(E3)$  and low-lying negative-parity excitations; LightGBM and GPR cut RMSE by **42%** vs baselines and SHAP highlighted deformation parameters as key drivers.
- Manuscript accepted at *Curieux Journal*; implemented k-fold CV, feature ablations, and uncertainty checks to avoid overfitting on sparse nuclei.

### Computer Vision & Perception Intern — Jio Tesseract Summer 2025

- Built a CUDA-accelerated EDA pipeline for the humanoid team that processed **40 TB** of logs and images; analysis time dropped **90%** (from **6 h** to **<30 min**).
- Integrated ROS2 with TensorRT pose estimation and wrote a kinematic-calibration routine that cut setup time by **40%**

### Forbes India — Tech Features & Contributor 2024–2025

- Authored two nationally published features (AI data annotation in India; digital twins for Indian cities) and collaborated with editors on framing industry use-cases for a non-academic audience.

### Solar Irrigation Impact Study — Oorja (Research Intern) 2023

- Interviewed farmers across sites and prototyped fixes (local parts stock, lighter trolley handles); women's solo operation rose to **55%**, with costs **-30%** and downtime **-80%**.

### Pediatric Oncology Data Analytics — Cuddles Foundation 2024–2025

- Cleaned and aggregated **100,000+** records from **50** hospitals; insights reallocated **Rs 120,000+** toward higher-impact interventions.

## EVENT PRODUCTION & OUTREACH

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### TEDxYouth@DAIS 2024–2025

*Head Curator & Technical Lead* *Mumbai, India*

- Ran curation, licensing, and show operations with a **20+** person team; the event sold out (**100+** attendees) and social promos reached **500k+**.

## ROBOTICS & STEM

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### FIRST Tech Challenge 2020–2023

*Mentor — Teams Matrix, Eureka, TISB* *India & Global*

- Mentored Team Matrix to a **#1** world ranking, Ochoa Division Championship, and **2<sup>nd</sup>** Place Think Award; created Onshape CAD and Java control modules reused by three teams.

### Competitions (Captain / Builder) Grades 9–11

*MakeX; Robotex; FIRST Robotics Competition* *International*

- **MakeX** — West India Regional Winner & World Champion; Best Engineering Notebook.
- **Robotex Entrepreneur Challenge** — World Rank **#3** with a climate-adaptive rainwater-harvesting roof prototype.
- **FRC** — Team Elev8 (Turkey Regionals): led subsystem CAD and authored match-strategy playbooks.

## TECHNICAL SKILLS

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**Languages/ML:** Python (NumPy, pandas, scikit-learn, PyTorch, TFLite, LightGBM), C++, Java, Embedded C **Robotics/Vision:** ROS2, MoveIt, OpenCV, MediaPipe **Hardware:** PCB design (KiCad), sensor integration, rapid prototyping **Data/Comms:** SQL, SHAP, Matplotlib; technical writing, public speaking

## ACADEMIC ENRICHMENT

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### Stanford University — Linear Algebra (ULO) Online

*Completed advanced course; achieved 103.28% overall with extra credit* *2025*