# VIDHMAN AGARWAL

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## EDUCATION

**Pathways School, Gurgaon**: Grades 11-12 (2017 - Present)

**Relevant Coursework**: HL Math Analysis and Approaches, HL Economics, HL Physics, SL Chemistry, SL Hindi B, SL English A Language & Literature

Class 9: 54/56; Class 10: 54/56, Class 11: 40/42

## ACADEMIC HONORS AND AWARDS

*School:*

- **Highest Excellence Awards** in 6/7 subjects for grades 9, 10
- **IB MYP Board Results Grade 10 Honor Roll**
- **Highest Excellence Awards** in 5/6 subjects for grade 11
- **Winner of the IB DP Mandated Collaborative Science Project** revolving around building water rockets and a base and measuring horizontal distance travelled.
- **IEO Gold Medal of Excellence** Grade 9, 10. School Rank 1 for the year 2023.

## STANDARDIZED TESTING

- SAT - **1560/1600** (Math - **790;** EBRW - **770**)
- IELTS - **8.5/9** (Listening - **8.5/9**, Speaking - **9/9**, Reading -**8.5/9**, Writing - **8/9**)

## INNOVATIONS

**Founder and Lead Engineer, SoulSound**

(2024 - Present)

- Developed **a portable assistive communication device** to **empower individuals with speech and hearing challenges** with the following features:
  - **Customizable message slots for recording phrases tailored to the user's needs.**
  - **Large tactile buttons** with custom-recorded messages ("Hello," "Help Me," "Bye") for intuitive operation, even by users with limited motor ability.
  - **Power system offering up to 3 months of battery life**.
- Collaborated with **Sarthak Educational Trust**, a leading NGO for disability inclusion, to **pilot-test SoulSound** with real users. (Demo)

**Lead Developer, Project Exoplanet.AI**

(2023)

- **Developed an ML-powered exoplanet simulator** that models user-designed solar systems by integrating orbital data, stellar characteristics, and planetary parameters to assess sustainability and the potential for habitability.
- **Applied ML techniques** to evaluate conditions for life, incorporating orbital mechanics and climate factors to improve the accuracy of habitability predictions.
- **Refined the simulator through expert mentorship**, receiving feedback from **Dr. C.V.S. Kiran (Skyroot Aerospace - India's leading private space launch company)**.

## PRE-PROFESSIONAL EXPERIENCE

**Voxomos.AI** (2025)

- **Researched Large Language Models (LLMs) and Neural Networks** under the mentorship of **Mr. Sandeep Kumar (Managing Director, Voxomos.AI)**
- **Conducted a comprehensive audit of Voxomos.AI's accessibility solutions**, identifying gaps and proposing enhancements.
- **Explored multiple research directions**, including phishing detection, sign language translation, and text augmentation tools
- Developed a Text-to-Braille Translator aligned with **Bharati Braille** (the standardized Braille system used across South Asia) with the following features:
    - **Dictionary-based mapping** of alphabets, matras, symbols, and punctuations across English and Hindi into Bharati Braille dot patterns, following government specifications.
    - **PDF ingestion and NLP-driven tokenization**, encoding text into Braille equivalents while preserving formatting, paragraphing, punctuation flow, and line spacing for a **book-like reading experience**.
    - **Multilingual support expansion** to Bengali, Gujarati, Tamil, Telugu, and Malayalam, ensuring wider regional applicability.
- Envisioned **next-phase integrations**, including coupling the translator with **low-cost Braille printers** and **AI-powered autocorrect**, to build a **holistic accessibility ecosystem** for NGOs.

## RESEARCH EXPERIENCE

**Independent Published Researcher, Curiex Academic Journal** (2024- 2025)

- Published a research paper - **Comparative Analysis of Deep Learning Models for Waste Classification Using Small Imbalanced Datasets** (Link).
    - **Analyzes AI-driven approaches to waste segregation,** focusing on the development of a mobile autonomous robot that can identify and sort waste streams efficiently.
    - **Proposes an integration of computer vision and AI algorithms** to enhance the accuracy of waste categorization, reducing reliance on manual labor in waste management systems.
    - Highlights the **potential of scalable, low-cost robotic solutions in addressing sustainability challenges in urban and rural contexts**, particularly in developing regions.

**Researcher, Summer Research School, Bulgaria** (2024)

- Authored a Review Paper - **Mobile Autonomous Waste Segregating Robot** (Link) (Paper Presentation).
    - **Investigates limitations in existing waste-sorting robotics** and identifies opportunities for more cost-effective, scalable solutions.
    - Outlines a **solar-assisted autonomous robot** that integrates infrared, ultrasonic, and camera sensors with brushes, a vacuum, and a mechanical arm to overcome cost, accuracy, and scalability challenges in waste segregation of paper, plastic, and glass.
    - **Evaluates energy efficiency, environmental constraints, and sensor reliability,** suggesting refinements for scalable design and heavier waste applications.

## STUDENT ORGANIZATIONS/GOVERNMENT

**Vice Head of Service, Middle School Council (Grades 6–10)** (2022 –2023)

- **Led fundraising initiatives**, including bake sales for Turkey–Syria Earthquake relief, mobilizing student participation and community support.
- **Launched student programs** such as *Leisure Time*, promoting engagement and collaboration across the middle school community. Contributed to organizing large-scale cultural events, including *JugalBandish*.
- **Served as adjudicator** in inter-school debate competitions, contributing to fair evaluation and student development.
- **Spearheaded the Climate Change Committee** for the *IB Festival of Hope*, coordinating awareness

campaigns and sustainability-driven student activities.

- **Designed promotional materials** for the *IB Festival of Hope* Open Mic.

## COMMUNITY ENGAGEMENT

**Service as Action, Grade 9 Annual Camps** (2022)

- **Renovated a local school's facilities** in Bhowali, Uttarakhand, by **tuckpointing walls**, **repainting classrooms,** and decorating cottages to create a more welcoming learning environment.
- **Organized a community *mela* for local children**, fostering joy, participation, and cultural exchange through games and activities.

**Service as Action, Grade 11 Annual Camps** (2024)

- **Built rainwater harvesting pits** in the Ramganga River Valley, Munsiyari, to support sustainable water collection for the local village community.
- **Led a village clean-up initiative,** improving environmental hygiene and creating healthier communal spaces.

## SUMMER PROGRAMS

**Plaksha University, Young Technology Scholars Program** (2024)

- Developed **a low-cost integrated health monitoring prototype** combining ECG, temperature, and $SpO_2$ sensors to create an accessible diagnostic solution for early detection of cardiovascular risks
- **Presented the project at the university's closing conference,** with Dr. Ravi Jasuja (Director, Translational Research & Discovery, BWH, Harvard Medical School; Co-founder, Plaksha University), in the audience.

## EXTRACURRICULARS

**Team Debate - First Speaker** (2020 - 2023)

- Semifinalists - Behes 4.0 National Team Debate Competition
- Semifinalists - Behes 9.0 National Team Debate Competition
- Finalists - Behes 11.0 National Team Debate Competition
- Quarterfinalists - MahaBehes June 2021 National Debate Competition
- Winners - School 'Locked Heads 1.0' Debate Competition
- Winners - School 'Locked Heads 2.0' Debate Competition
- Attended WSDA Slovenia Team Debate Academy 2023
- Quarterfinalists - WSDA Slovenia Debate Competition

**Sports**

**Karate** (2015 - 2023)

- Junior Black Belt Holder
- 9 years of practical experience, certified by Kaishogun Karate-Do India.

## ONLINE COURSES

- HarvardX CS50P: CS50's Introduction to Programming with Python

## SKILLS

- Proficient in Hindi and English.
- Proficient in Python, Markup Languages such as HTML & CSS.