



PORTFOLIO

Ayush Singh



OCTOBER 3, 2025

MECHANICAL ENGINEERING, PANDIT DEENDAYAL ENERGY UNIVERSITY
India

Table of Contents

Bachelors	2
Academic Excellence & Achievements	2
Research Work	5
Skill Development Programs	8
STEM Activities	13
Extracurricular Activities & Leadership	16
Internships	22
Sports	23
Civic & Social Service	24
Primary & High School	27
Extracurricular Activities.....	27
Internship.....	35
Academic Excellence & Awards	36
Fine Arts.....	39
Skill Development Programs	44
Sports	46
Community Service.....	51

Bachelors

Academic Excellence & Achievements

- 1) 1st rank at Mechanical Engineering department, Pandit Deendayal Energy University



- 2) 100% Tuition-Fee Waiver Merit-based Scholarship

- 3) GPA: 9.92/10 (WES 3.98/4)

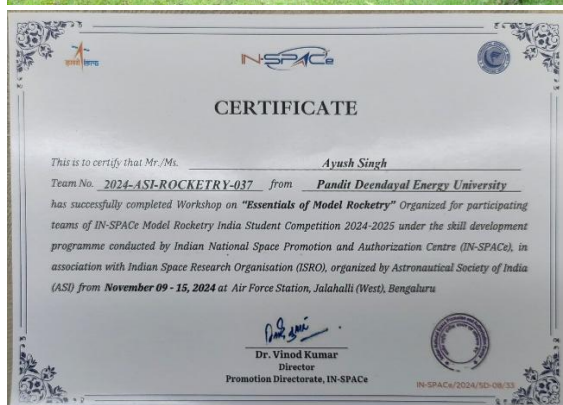
- 4) Bhalodia-Khetan Summer Research Excellence Award and 50,000 INR prize at IIT Gandhinagar for CFD-based research on snow-avalanches.



- 5) Top 3 position among 45+ teams in the Mechanical Department Hackathon, Mech-A-Thon for the problem statement “Optimized Structural Design of an Aircraft Wing Spar for Weight Reduction and Strength Enhancement”



- 6) 10-day residential training on model rocketry by ISRO (55 students selected amongst students all over India). Scored 2nd highest grade 'GOOD' in the 1-credit Model Rocketry Course.



- 7) Completed a 2-credit course on 'Introduction to Launch Vehicle Analysis & Design' by IIT Bombay.



- 8) Completed a course on Metal 3D printing by Michigan University. [Coursera | Online Courses & Credentials From Top Educators. Join for Free | Coursera](#)



Research Work

- 1) Presented a review paper at the "1st International Symposium on Battery Technology - Recent Trends and Advances" titled "Additive Manufacturing of Batteries - Recent Trends and Challenges". Paper in review for publication.



1st International Symposium on Battery Technology
January 19-21, 2024, Ahmedabad, Gujarat, India

Additive Manufacturing for Batteries: Recent Trends and Challenges

Ayush Singh¹, Dr. Ojas Satbhai²

^{1,2}Department of Mechanical Engineering, Pandit Deendayal Energy University, Gujarat, India

²Corresponding author

23bme099@soi.pdeu.ac.in
ojas.s@soi.pdeu.ac.in

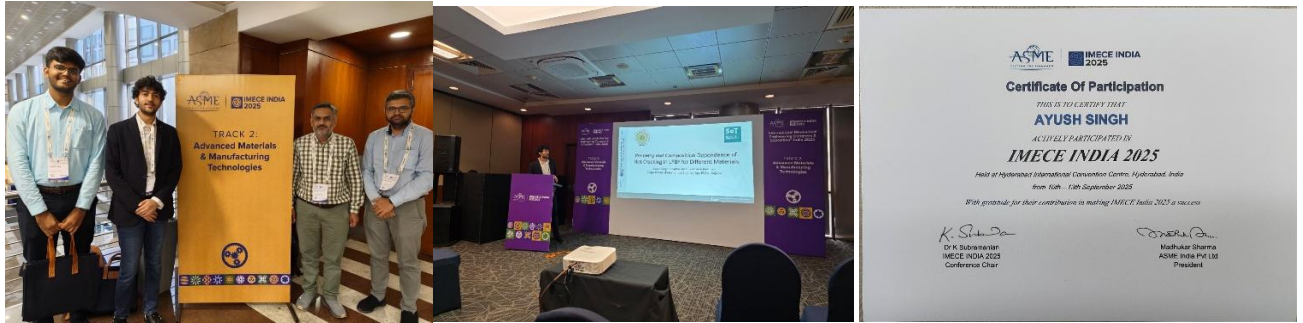
Abstract: There is a surge in battery manufacturing across the globe due to various advantages in terms of energy efficiency and localized mitigation of carbon footprint. The world needs non-conventional Industry 4.0 sustainable methods for manufacturing of Batteries. Additive Manufacturing (AM) is becoming extremely popular among battery manufacturers. This paper provides a review of the trends and challenges for various Additive Manufacturing techniques used for the manufacture of batteries. Along with AM is provided as the need for increasing demands like higher capacity, fast charging rate, long cycle life and cost reduction, the challenges in AM are reported. An exhaustive review including the electrodes microstructure with different materials and AM techniques, data driven manufacturing, and state-of-the-art manufacturing process has been conducted.

Keywords: Battery; Additive Manufacturing; microstructure electrodes; data driven manufacturing; state-of-the-art manufacturing; futuristic manufacturing; recycled batteries; flexible batteries



- 2) Present my review paper on the topic "Property Dependence of Hot Cracking in LPBF for different materials" at the "15th International Conference on Advancements in Polymeric Materials (APM-2024)", CIPET-IPT. Published in the proceedings of the conference.

- 5) Presented my review paper “Property and Composition dependence of hot cracking in LPBF for different materials” at the International Mechanical Engineering Congress and Exposition (IMECE-India 2025) by ASME. Paper accepted for publication.

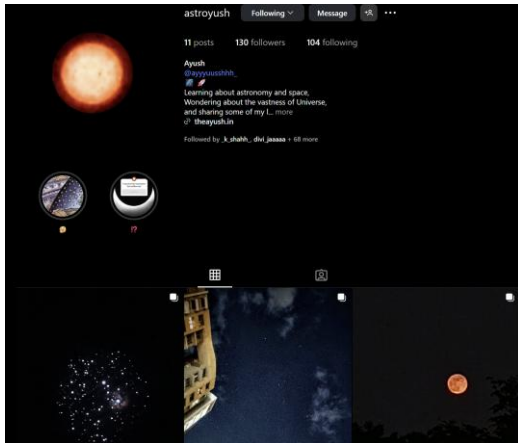


- 6) Attended the Composite Industries National Conclave and Exhibition (CINCE 2025) at Ahmedabad University and presented the metal 3d printing stall at the exposition of the conference.



Skill Development Programs

- 1) Created and actively manage a dedicated Instagram account for astronomy. [Instagram](#)



- 2) 2-day Data Science Workshop by dept. of Mathematics



- 3) 3-day hands-on workshop on Laser Powder Bed Fusion (Metal 3D printing)



4) 3-day hands-on workshop on Laser Powder Bed Fusion (Metal 3D printing)



5) 5-day hands-on workshop on Advanced Welding (explored 9 different types of welding)



6) 5-day CFD workshop with Python



7) 5-day skill development program on 'Basics of Modelling' in NX



8) 5-day CFD workshop with Ansys and OpenFOAM.



9) 2-day workshop on LaTeX for scientific writing



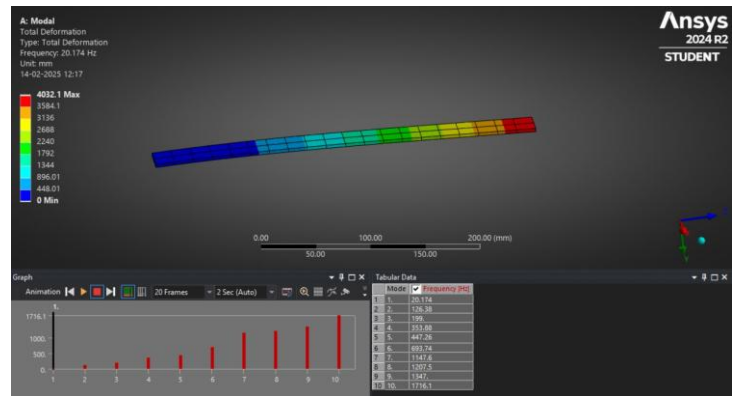
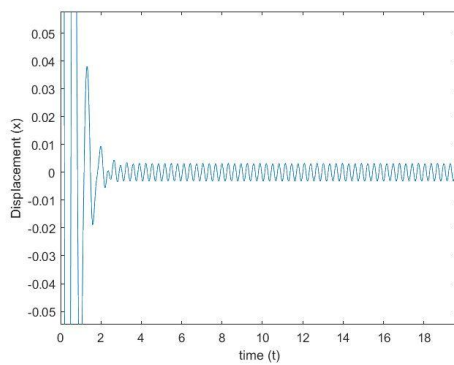
10) 5-day hands-on workshop on CNC turning with Siemens controller



11) 3-day workshop on water treatment and management at the water treatment center of excellence at PDEU



12) 3-day workshop on vibration analysis with MATLAB and Ansys



STEM Activities

- 1) Member of professional bodies, American Society of Mechanical Engineers (ASME), Society of Automotive Engineers (SAE), Indian Institute of Welding (IIW).
- 2) Volunteering at Gujarati Literature Festival at Gujarat University for Astronomy observation with Tanmaye's Amazing Space.



- 3) Delivered session on model rockets and demonstrated static motor test at STEM Carnival organized by SciKnowTech.



- 4) Invited as the judge for a STEM and team building competition on building balloon structures. Volunteered for organizing extempore competition on youth day with SciKnowTech Foundation, VIPNET science club.



- 5) As part of the STEM activity at the year-end science carnival organized by SciKnowTech, I conducted an egg-drop challenge event and volunteered for the overall carnival.



- 6) Gujarat Science City visit as a STEAM activity, guided children of different ages in the space gallery, robotics gallery and aquatic gallery of the science city. [Instagram](#)

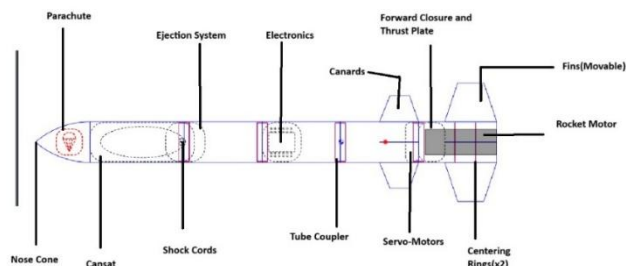


- 7) Guest speaker at the Gujarat University for Startup and Entrepreneurship Council (GUSEC) to give a talk on rockets on the occasion of ISRO day and Youth day. [Instagram](#)



Extracurricular Activities & Leadership

- 1) Founding President of the SciKnowTech VIPNET Science club, made for children and by children. It has now become a well-known national initiative under the SciKnowTech foundation and government of Gujarat. Now I am serving as the mentor for the club, also volunteering for events year-long.
- 2) Lawn Tennis Secretary at PDEU. Managed Inter-University Sports Cup (Energy Cup) in the years 2024 and 2025, along with small events like intra-cup, fresher's and team selection.
- 3) Technical Subcommittee member at Encode – Programming club of PDEU.
- 4) Treasurer and Technical Engineer at Apogee – the aerospace club of PDEU. Apogee mostly focuses on model rocketry designing different types of rockets and experimenting with different technologies. We have used sugar, black powder and sorbitol fuel over the 3-year experience. We have developed reusable solid motor casings with De-Laval nozzle design. I do design, analysis of rocket and its trajectory along with heading the overall technical department as a systems engineer. As the treasurer, I have managed a total of around ₹1 Lakh along with raising sponsorship of ₹3 Lakh. We have participated and reached the final round of the national level model rocketry competition organized by ISRO.



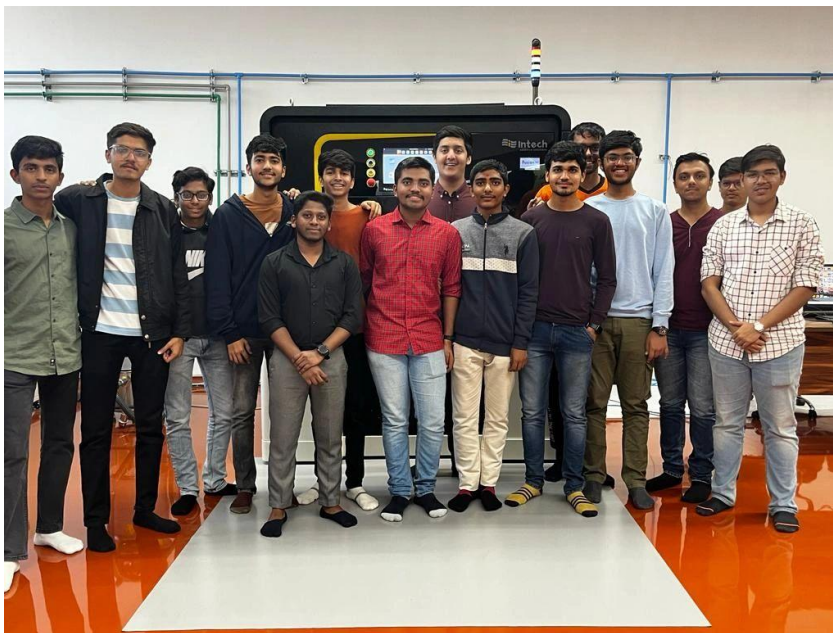
- 5) Logistics Subcommittee member at Daastan – the dramatics club of PDEU.



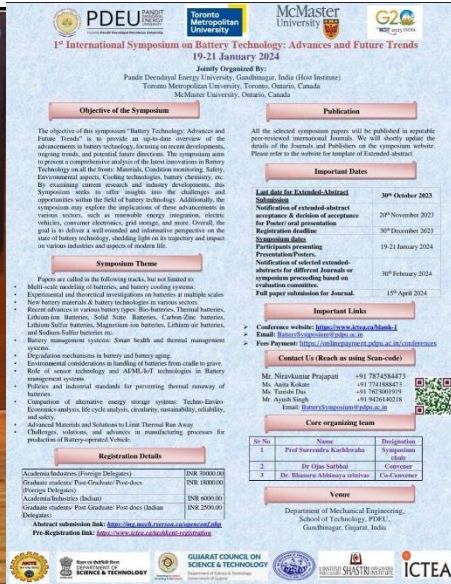
- 6) Selected to showcase metal 3d printing facility at PDEU to chairman and richest man in India, Dr. Mukesh Ambani



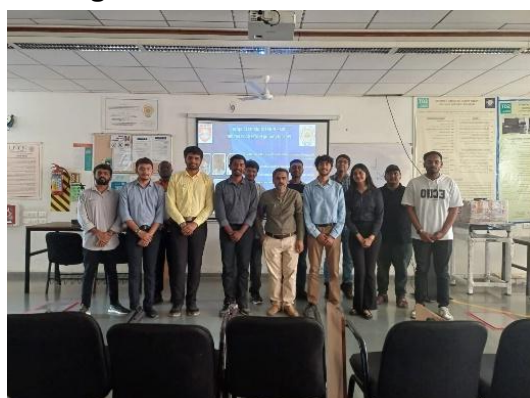
- 7) Lead and delivered 1 hour session on Metal 3D printing to Mechanical Engineering 1st year students.



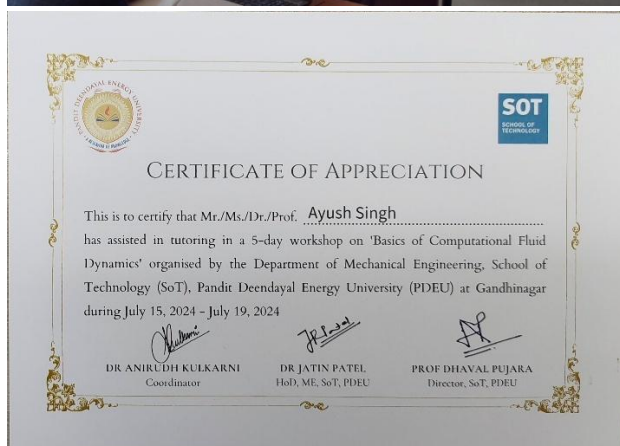
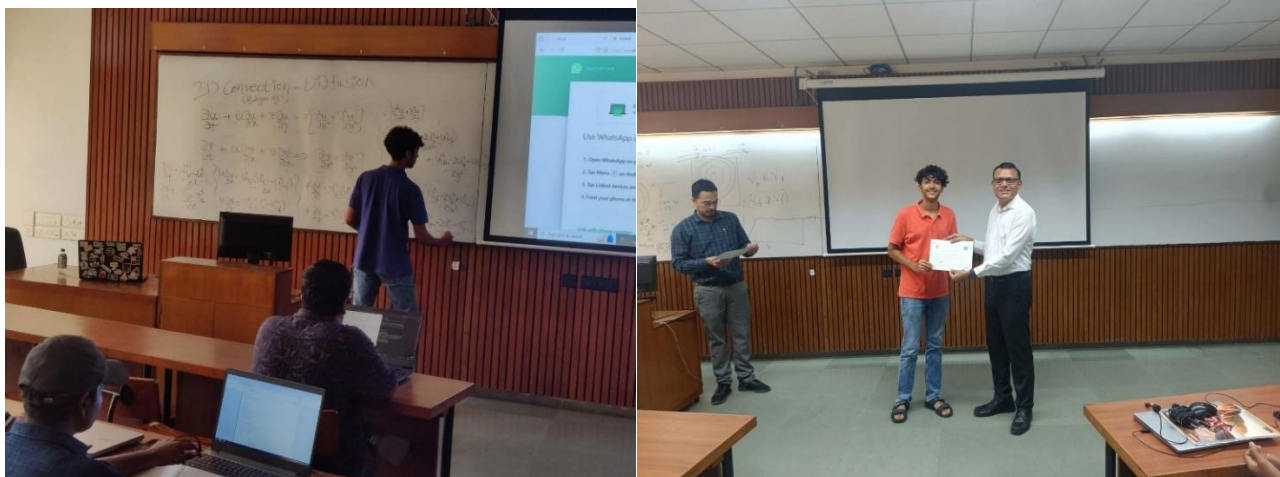
- 8) Anchor and Lead Coordinator at the 1st International Symposium on Battery Technology, jointly organized by PDEU, ICTEA, McMaster University, Toronto Metropolitan University.



9) Delivered a session on my review paper to MTech, Mechanical 1st year students during the “Young Profession Seminar” as an invited speaker.



10) Coordinated and delivered lectures during the 5-day CFD workshop.



11) Volunteered and coordinated 5-day CFD hybrid workshop.

PDEU PANDIT DEENDAYAL ENERGY UNIVERSITY
GANDHINAGAR, SURAT

DEPARTMENT OF MECHANICAL ENGINEERING
PANDIT DEENDAYAL ENERGY UNIVERSITY

Five Day Skill development Workshop on
Computational Fluid Dynamics (Hybrid Mode)

Program Highlights

- Introduction
- FVM/FDM/FEM
- Lattice Boltzmann Method
- Using Codes, Ansys/Openfoam
- Multiple case studies

Registration Fees:
For PDEU Participants: INR 250
Others: INR 500

Hybrid Mode
Max 50 participants(Offline)
E-certificates for all participants

Program details
Dates: 17-19 August 2024, 24-25 August 2024.
Mode of Conduct: Hybrid Mode
(*Participants should be equipped with a Laptop.)

9:00 AM - 1:00 AM CFD methodologies and case setup demonstration. [Register Here](#)

01:00 AM - 02:00 PM Break.

02:00 PM - 06:00 PM Hands-on approach for FVM using Ansys/OpenFOAM

Contact us for any queries

Convener:
Dr Ojas Satbhai
ojas.s@pdeu.ac.in

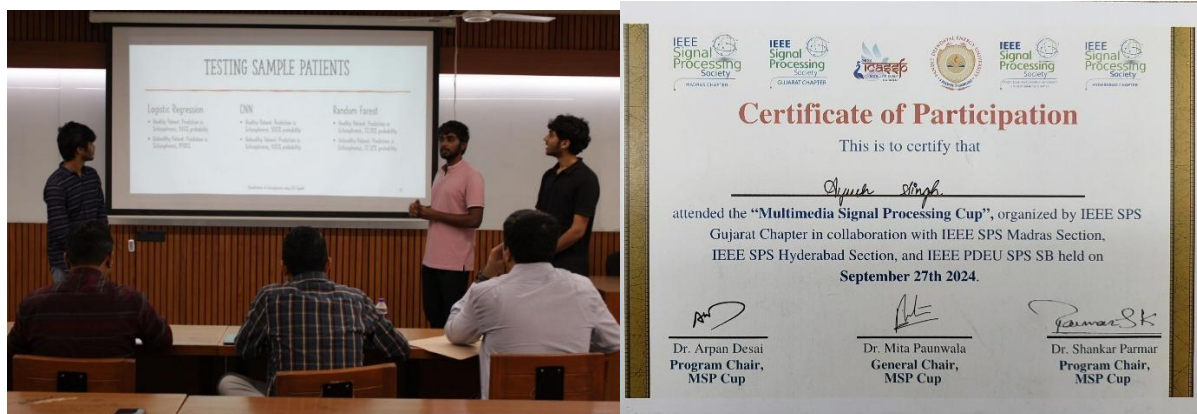
Student Coordinator
Tanishk: +91 7823001919
Sherwin: +91 8320941273
Sachin: +91 8160524597
Ayush: +91 9426140218



12) Delivered a talk on model rocketry and showcased a rocket launch to first year students.



13) Consolation cash prize at MSP Cup IEEE Hackathon.

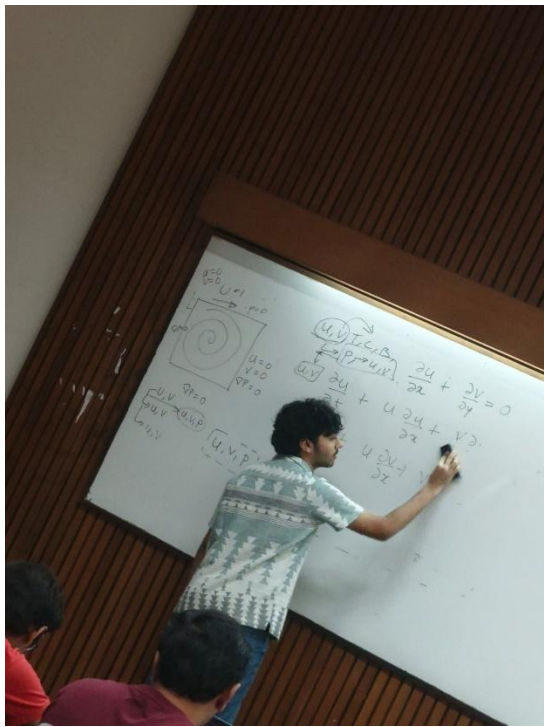


14) Presented model rocketry work to Dr. Mukesh Ambani.



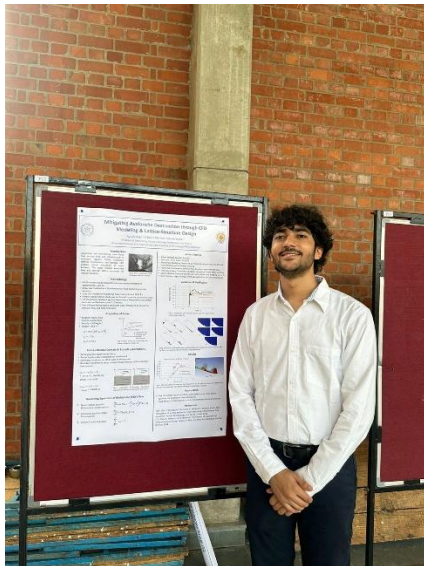
15) Created a AI-driven hospital management system for the Smart India Hackathon (SIH 2023) and went to the pre final round of the national competition. Focused on web development part using PHP and Flask.

16) Coordinated and delivered lectures during the 5-day CFD workshop.



Internships

- 1) I successfully completed a 2-month research internship at IIT Gandhinagar. Worked on developing lattice-based structures to reduce impact from snow avalanches by means of CFD modeling. Selected for the prestigious internship amongst the 200 students selected all over India.



Confirmation of Participation in SRIP at IIT Gandhinagar

External Inbox



SRIP IIT Gandhinagar <webmaster@iitgn.ac.in>

Thu, Mar 20, 7:21 PM



Hello Ayush Singh,

We are pleased to inform you that you have been selected to work on project code IP0MK0000012 entitled "Aerodynamic analysis of electric distribution towers" as part of SRIP 2025. Your advisor will be Professor Manish Kumar.

Kindly confirm your participation in SRIP 2025 with this [Link](#). After confirmation, please [register](#) yourself for this portal. All the submissions will be accepted through this portal only.

Please note below the mandatory requirements of the program. A research proposal will be due One week after joining. You are encouraged to develop a proposal in consultation with your faculty advisor.

The last date for receiving acceptance is **March 28, 2025**. There will be no extension for the acceptance deadline under any circumstances.

Please note that you may get multiple offers from multiple projects but you can ONLY select ONE.

Research proposal due	One week after joining
TF Diary entries due	Every Tuesday
Mid-term report due	3 weeks after joining
Final report due	7 weeks after joining

- 2) Created and presented a detailed review work on the Sun and its characteristics.

Tanmaye's
Amazing Space

Joining Letter

Dear Ayush,

Following your application and subsequent interview, Tanmaye's Amazing Space is pleased to inform that you have been considered for an internship program in the company and we would like to offer you the same.

The internship will take place in Ahmedabad, Gujarat. The role / working of the same will be as a **Space Science content Developer for website and Outreach**. The working hours will be 12 hours weekly, excluding Sunday. It is a 3 months internship starting from 1st September, 2023.

By accepting this offer, you agree that throughout your internship experience, you will observe all policies and practices governing the conduct of our organization, also any other confidential information that has been provided to you by Tanmaye's Amazing Space, you won't be using it for your own purposes or disclosing it to anyone outside Tanmaye's Amazing Space, also this includes our policies prohibiting discrimination and harassment.

I hope that your association with the company will be successful and rewarding. Please indicate your acceptance of this offer by signing below and returning it to our official email id. For any queries do write to us without any hesitations.

Date: 27/08/2023
Place: Ahmedabad

Tanmaye's Signature
Founder's Signature

Amazing Space

Subject: Internship Program

We are glad to inform you that Ayush Singh, has completed his internship at "Tanmaye's Amazing Space". He has done wonderful work in developing a report on "Sun and its characteristics". He worked thoroughly and provided fruitful work to the company. He has done good work in development of creative content for the company. His hard work and dedication towards the subject has brought valuable output to the company.

His internship duration was starting from September 2023 to December 2023.

Warm Regards,
Tanmaye Vyas,
Tanmaye's Amazing Space

Place: Ahmedabad
Date: 13-9-23

ISRO recognised Space Tutor

Headquarters: 9824318165 (Ahmedabad, Gujarat)
Branch: 9079184953 (Jaipur, Rajasthan)

Info: @tanmayesamazing.space
Link: www.tanmayesamazing.space
Link: <https://www.linkedin.com/company/tanmayesamazing-space>

ISRO recognised Space Tutor

Headquarters: 9824318165 (Ahmedabad, Gujarat)
Branch: 9079184953 (Jaipur, Rajasthan)

Info: @tanmayesamazing.space
Link: www.tanmayesamazing.space
Link: <https://www.linkedin.com/company/tanmayesamazing-space>

37 - Magnetic Field title sl...

38 - Magnetic Field of Sun

39 - Irregularities in Magn...

40 - Magnetic Clouds

41 - Surface features - titl...

42 - Photosphere features

43 - Sunspots

44 - Are sunspots black??

45 - Sunspots

46 - Types of Sunspots

47 - Solar Supergranules

48 - Sunspot groups

49 - Sunspots without pairs

50 - Solar Faculae

51 - Solar Granules

52 - Solar Supergranules

53 - Features of Chromosphere

54 - Chromospheric Netw...

55 - Filaments and Plage

56 - Solar Prominence

57 - Spicules

58 - Coronal Features

Sports

- 1) Regular lawn tennis player from the age of 5. Went to the state level (Gujarat State Tennis Association) Tournament. Participated in many Lawn Tennis and Karate tournaments.
- 2) Gold medalist in Belvedere Club Lawn Tennis Tournament 2025, Team Event.



- 3) Gold Medalist in Singles and Bronze Medalist in Team Event at Belvedere Club Lawn Tennis Tournament 2024.



Civic & Social Service

- 1) As part of rural volunteering work in a 14-day summer internship at the Rotary Club of Shantigram, surveyed a village and worked with the authorities to better understand the requirements of the people, promoted waste management and segregation and visited 3 government schools to teach about global warming and the need to save the earth. I also volunteered at the international Yoga Day celebration event.



- 2) As part of the continued volunteering at the Rotary club of Shantigram events all over the year, volunteered at the blood donation camp by the Rotary club in association with the Red Cross India. Donated blood for the first time along with volunteering for setup of stall and registration.



Indian Red Cross Society	
Ahmedabad District Branch	
Kran Chudgar Ahmedabad Red Cross Shataladi Bhawan, 6-7, Vrundavan Park, Sherdil Red Cross Marg, Nr. Navrang Circle, Navrangpura, Ahmedabad-380 009. Phone: (079-26651020), 26651030, Mobile: 97277 45604 Follow us on facebook instagram	
Dear "Sherdil" <u>Ayush S. Singh</u>	
you have donated your blood on <u>15/08/2025</u> 49025/25	
at <u>Rotary Club Shantigram</u>	
and have helped us in saving more than one human lives. We appreciate your gesture and thank you for the same. Repetitive blood donations keep the donor healthy and also improve the health of society at large. Your generous blood donation has helped country in achieving 100% voluntary blood donation for health services. In the service of Red Cross,	
 Amit Doshi Chairman	 Dr. Vishvas K. Amin General Secretary
START DONATING BLOOD AT AGE 18 & BE A MEMBER OF "CLUB 25 / 25 YEARS"	

3) Working to volunteer at events with La Foret Education Trust (NGO).

**"CHANGE IS THE ONLY
CONSTANT – THE BRIDGE
EVERY CHILD CAN CROSS
TO LEAVE BEHIND
LIMITATION AND WALK
INTO ENDLESS
POSSIBILITY."**



Ayush Singh
Intern



admin@laforet.org.in



+91 6355 146 782



<https://laforet.org.in>

Primary & High School

Extracurricular Activities

- 1) Vice President (2021 – 2023), Minister (2020 – 2021), Deputy Minister of Systems Affairs Ministry (2019 – 2020) in the School Parliament. Organized events, managed daily activities at school such as field trips, arrival and dispersal, school code of conduct and discipline, food wastage, anchoring and school fests, etc.



- 2) Head of Backstage department in the School Annual Function, 2022. A prestigious position for the senior year of high school. [Backstage Head - Instagram](#)
- 3) Selected in top 130 ideas in India in the Children Innovation Festival (CIF – 2019).



- 4) Third winner in online COVID-19 Idea Challenge on 'Artificial Intelligence and Robotics' organized by the innovation hub, Vikram A Sarabhai Community Science Center (VASCSC), Ahmedabad, 2020.



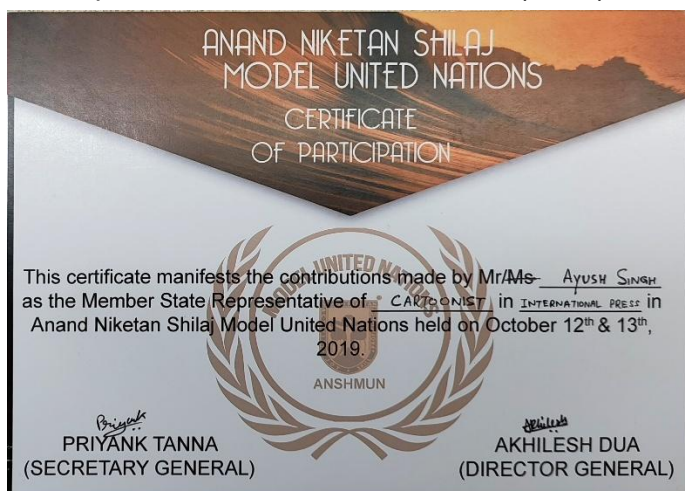
- 5) Invited as a panelist for Make-Innovate-Lead on National Science Day competition, 2021.



- 6) Drummer in school drum band.
- 7) I participated in National West Region (NWR) ICSE competitions.



8) Participated in Model United Nations (MUN) as cartoonist.



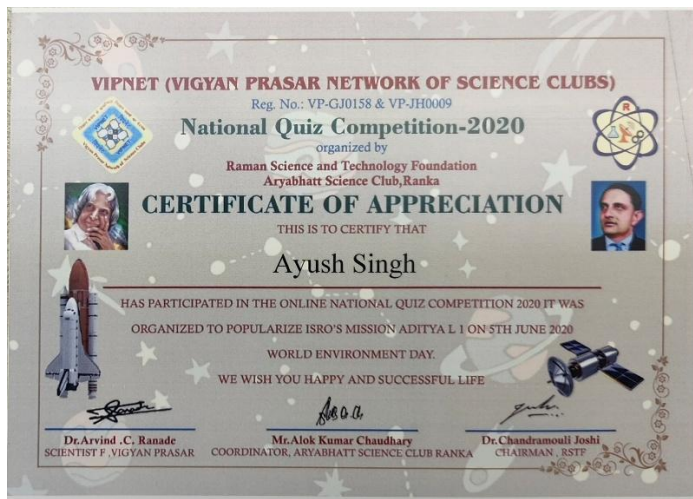
9) 3rd in inter-house quiz competition in Anand Niketan Shilaj School, 2020.



10) 2nd in inter-house best-out-of-waste competition at Anand Niketan Shilaj School, 2020.



11) Participated in online national quiz competition, 2020.



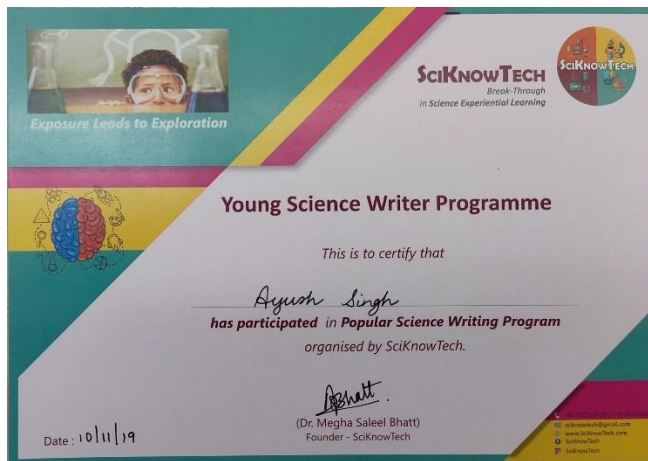
12) Participated in the Children Innovation Festival 2020 and CIF Mega Bootcamp organized by GUSEC & UNICEF, 2020.



13) 2nd in Science Carnival Quiz Competition at SciKnowTech annual event, 2019.



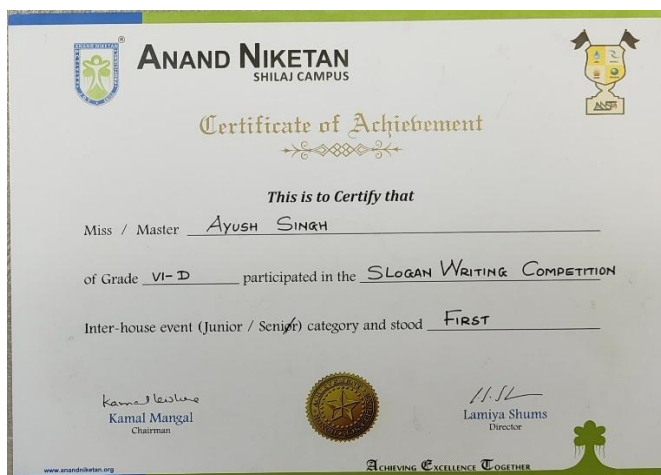
14) Participated in Young Science Writer's Program, 2019.



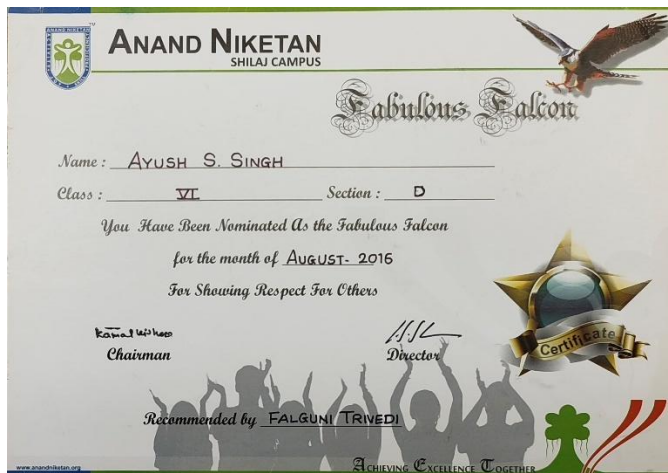
15) 2nd in Science Carnival Quiz Competition at SciKnowTech annual event, 2018.



16) 1st in slogan writing competition in Anand Niketan Shilaj School, 2016.



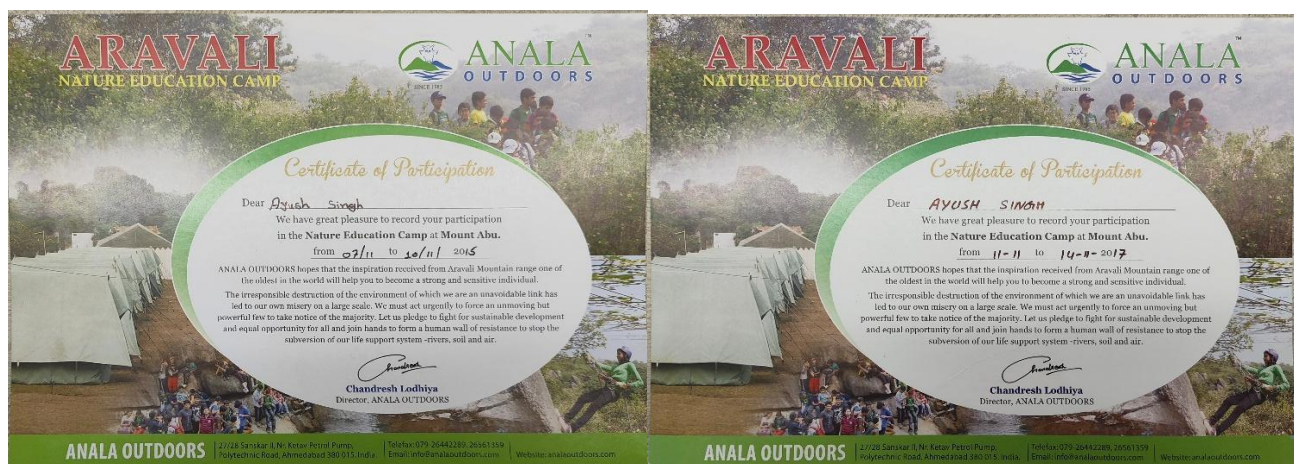
17) Respect for Others award as the fabulous falcon of the month, 2016.



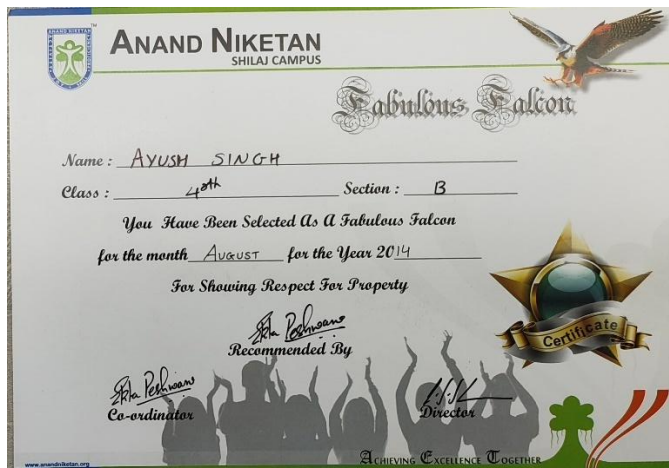
18) Participated at 2-day Jambughoda trek with Anubhav Outdoors, 2015.



19) Participated in the 4-day trek in the Aravali mountains at Mount Abu by Anala Outdoors, 2015 & 2017.



20) Respect for Property award as the fabulous falcon of the month, 2014.



21) Participated in Maker Fair 2K18 at Anand Niketan Sughad School.



22) Participated in Science Ideation event in Zyfest.



23) Participated in the Chinmaya Geeta Chanting Competition, 2016.



24) Participated in the Chinmaya Geeta Chanting Competition, 2015.



Internship

- 1) Trained 800+ International Students in C programming and game development with Unity during 1-month internship at Royal Technosoft, 2020.



Academic Excellence & Awards

25) Qualified Post-Training Assessment for Scratch by Google



26) Shri Shivprasad Mangal Scholarship Award for 100% attendance in 2016 – 2020, for 4 years.



27) Participated and showcased my innovation at the Children's Climate Conference, 2019.



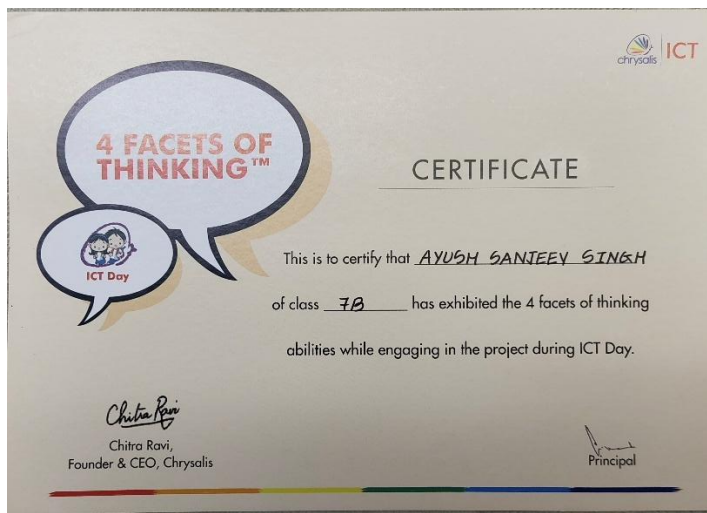
28) 1st rank in school in the National Cyber Olympiad, 2015.



29) Multiple participations in the National Cyber Olympiad, National Science Olympiad, International Math Olympiad and International English Olympiad.



30) Participated in the ICT day to showcase a game made in the greenfoot software, 2017.



31) Participated in Asset Tests.



Fine Arts

- 1) Winner of the Shantigram Drawing & Painting Competition, 2018.



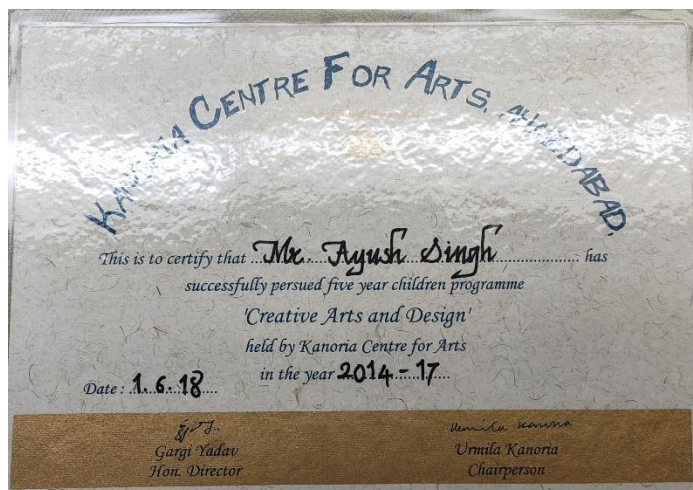
- 2) 2nd prize in Painting Competition at CEPT university, 2018 and a cash prize of ₹2,000.



- 3) 3rd position in inter-school color-creek art competition, Shanti Asiatic School, 2022.



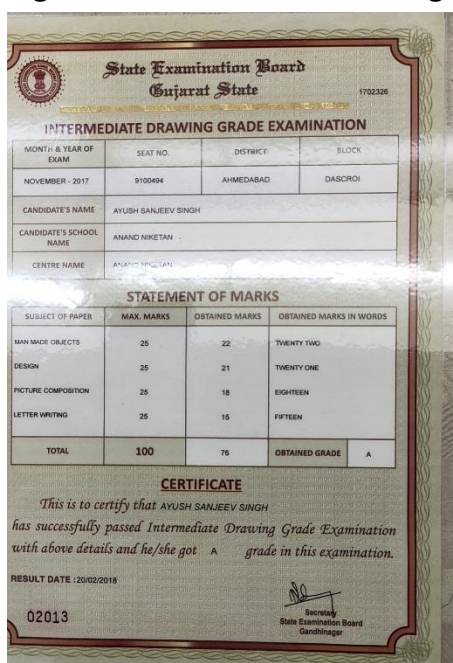
- 4) 5-year course on Creative Art & Design at Prestigious Kanoria Center for Arts, Ahmedabad.



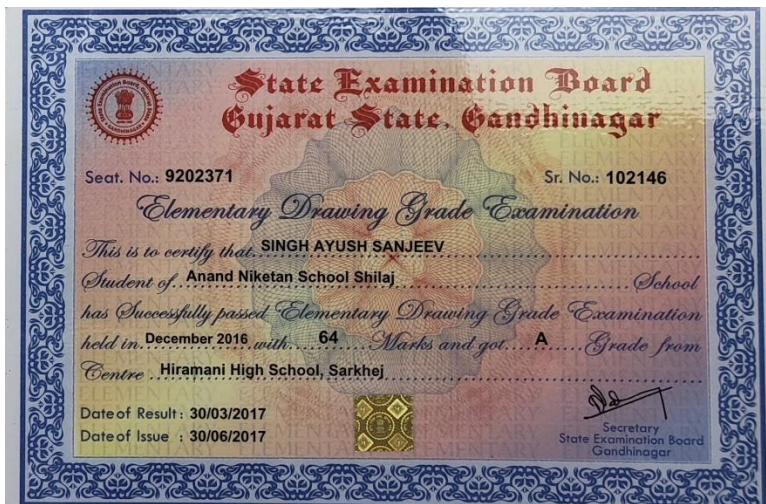
5) 1st position in 'Art Mela' by Pearl School, 2017.



6) A grade in intermediate Drawing Grade Examination.



7) A grade in Elementary Drawing Grade examination.



8) 2nd position in Drawing competition at Indian Institute of Management, Ahmedabad.



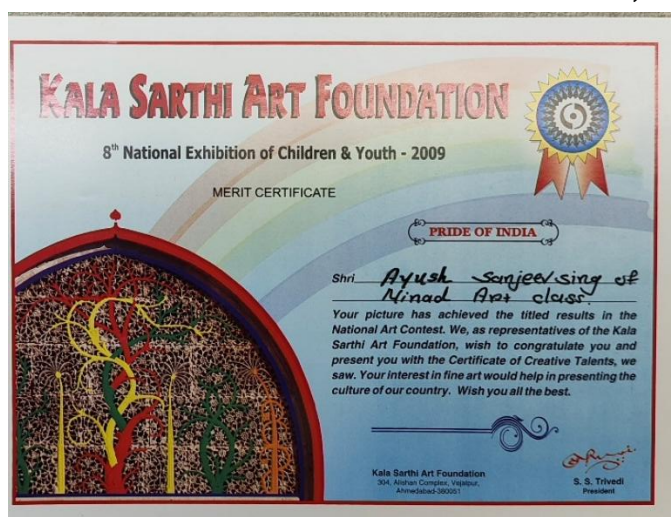
9) Achieved titled results in National Art Contest, 2010.



10) Won merit certificate in all India national interschool talent hunt sit and draw competition.



11) Achieved titled results in National Art Contest, 2008.



12) Gold medal in International Children's Art Competition by Konaseema Chitra Kala Parishad.



13) Participated and awarded merit certificate at the 8th International Child Art Competition, 2010.



14) Participated in My FM drawing competition, 2019.



Skill Development Programs

- 1) Java, Python, Game Development with Unity, C, C++, HTML & CSS Web dev, Robotics with Arduino UNO in a 2-year programming course



- 2) LetsCode Workshop on concepts of Computer Programming



- 3) Participated in the 'Skills for Growth', international program to prepare children for the 21st century.



Sports

- 1) Participated in the Lawn Tennis Skill Workshop organized by Sports Village Academics, 2019.



- 2) Runners up at the Shantigram Resident Cricket League, 2018.



- 3) Runners up at the state level lawn tennis tournament, 2017 organized at Belvedere Club.



- 4) Bronze medalist at Gujarat State Karate Championship, 2016 in individual Kumite organized by Shito-Ryu Kohshi Kai Karate Do Gujarat.



5) Pre-quarter in the Belvedere Open Lawn Tennis Tournament, 2019.



6) Participated in the SRAG – Gujarat State Ranking Tournament, 2023.



7) Participated in the Belvedere Open Lawn Tennis Tournament, 2021.



8) Participated in SRAG – Gujarat State Ranking Tournament, 2021.



9) Participated in SRAG – Gujarat State Ranking Tournament, 2019.



10) Participated in the Belvedere Badminton Tournament, 2018.



11) Participated in the Belvedere Open Lawn Tennis Tournament, 2018.



12) Participated in the 10th Gujarat State Sports Karate Championship, 2015.



Community Service

- 1) Contributed in the 'Ek Ehsaas (A Feeling)' scheme, 2014.

