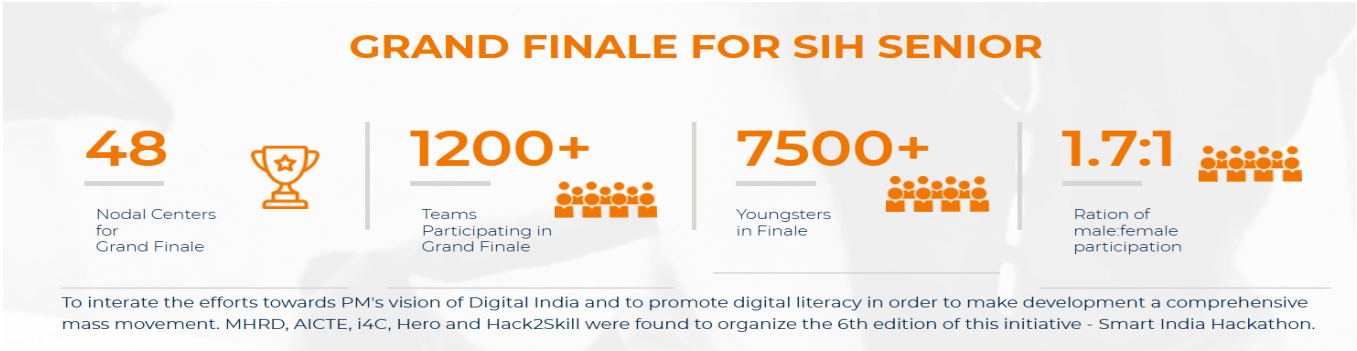
MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Awards Received at different events

Smart India Hackathon (SIH) – 2023

(Hardware Edition)



Achievement	**:**	Winners
Event	**:**	Smart India Hackathon (SIH) – 2023
Organized by	**:**	AICTE, MoE'S Innovacation Cell
Sponsored by	**:**	AWS, Hero
Event Place:	**:**	Nalla Malla Reddy Engineering College, Hyderabad, Telangana

Worked on:

PS Number	SIH1507
Category	Hardware
Theme	Transportation & Logistics
Organization	Ministry of Mines
Problem Statement Title	Frequent Dislodgement of belt conveyor along hilly terrain for various reasons

Student Details:

Roll No	Name of the Student	Year of Studying	Dept.
217Y1A05F5	P Navaneeth Reddy	III	CSE
217Y1A05I5	A Vamshi	III	CSE
217Y1A05F0	V Joshi Vishal	III	CSE
217Y1A05E3	D Gouthami	III	CSE
217Y1A05B5	V Samanth Mallik	III	CSE
217Y1A0542	G Rajeshwari	III	CSE

The **Smart India Hackathon (SIH) 2023** was a **nationwide initiative** by the **Ministry of Education's Innovation Cell (MIC)**, in collaboration with **AICTE, i4c**, and other organizations. It aimed to provide students a platform to solve pressing real-world problems through innovative tech solutions.

It had two formats:

1. **Software Edition** – Digital/tech-based solutions (apps, platforms, algorithms).
2. **Hardware Edition** – Physical products or embedded/IoT-based solutions.

These problem statements span various themes, including:

- Agriculture and Rural Development
- Smart Automation and Industry

- Transportation and Logistics
- Smart Cities and Infrastructure
- Healthcare & Biomedical Devices
- Energy/Power/Water
- Heritage & Culture
- Security & Surveillance
- Environment and Sustainability
- Blockchain, AI, ML, and AR/VR
- Miscellaneous (education, administration, legal tech, etc.)

Team Formation & Eligibility:

- **Team Composition**: Each team must consist of **6 members**, including a **Team Leader** and **at least one female member**.
- **Institution Criteria**: All team members must be from the **same institution**; inter-college teams are not allowed.
- **Academic Level**: Participants can be from any year of study (E1 to E4).
- **Mentorship**: Teams may select mentors to guide them through the process.
- **Restrictions**: A student cannot be part of multiple teams, and team members cannot be changed after registration.

Registration Process:

1. **SPOC Registration**: Each institution must appoint a **Single Point of Contact (SPOC)**, typically a faculty member, who will handle all communications and registrations.
2. **Internal Hackathon**: Institutions conduct an internal hackathon to shortlist teams.
3. **Team Nomination**: The SPOC nominates up to **50 teams** (45 shortlisted + 5 waitlisted) based on the internal hackathon results.
4. **Idea Submission**: Nominated teams submit their ideas through the SIH portal.

Key Dates for SIH 2024:

- **Launch of SIH 2023**: 23rd August 2023
- **Registration & Idea Submission**: 23rd August – 31st October 2023
- **Idea Evaluation**: 16th October – 15th November 2023
- **Announcement of Finalists**: 15th – 25th November 2023
- **Announcement of Nodal Centers**: 25th November 2023
- **Grand Finale**:
    - **Software Edition**: 19th – 20th December 2023
    - **Hardware Edition**: 19th – 23rd December 202

Figure: Smart India Hackathon 2023 (Hardware Edition) at IITR

Figure: Certificates Received at SIH -24 Hardware Edition

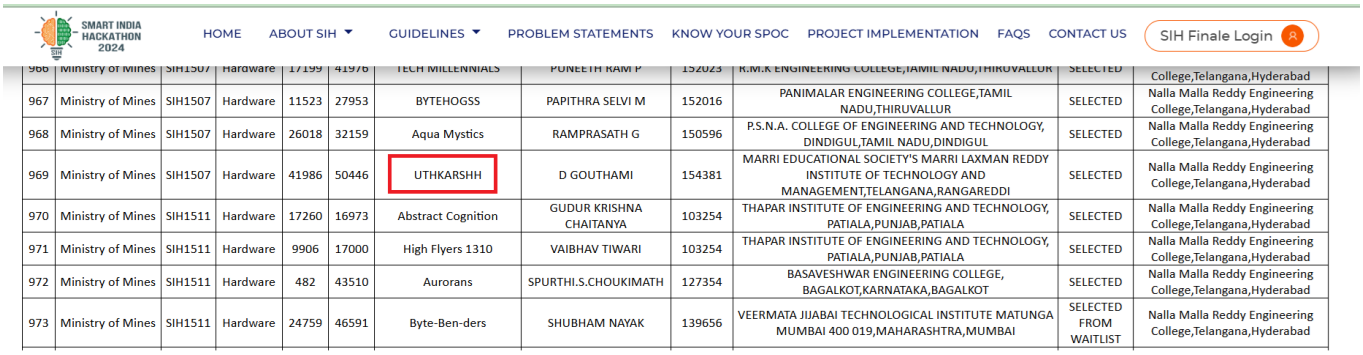
Nodal Center List for SIH-2023 Grand Finale:

https://sih.gov.in/shortlisted-nodel-centres-2023

				SIH1482		Hardware
46	Nalla Malla Reddy Engineering College	Telangana	Hyderabad	SIH1335	Ministry of Mines	Hardware
				SIH1336		Hardware
				SIH1337		Hardware
				SIH1507		Hardware
				SIH1511		Hardware

Shortlisted List for SIH-2023 Grand Finale:

https://sih.gov.in/sih2023-screening-final-result

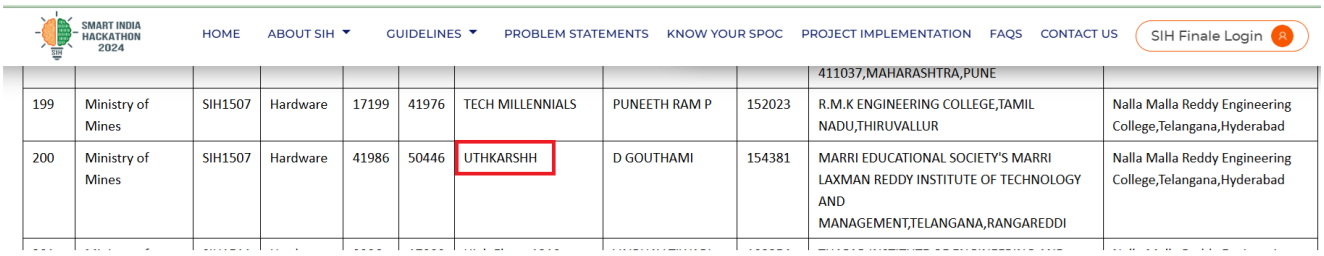


SMART INDIA HACKATHON 2024 | HOME | ABOUT SIH | GUIDELINES | PROBLEM STATEMENTS | KNOW YOUR SPOC | PROJECT IMPLEMENTATION | FAQS | CONTACT US | SIH Finale Login

966	Ministry of Mines	SIH1507	Hardware	17199	41976	TECH MILLENNIALS	PUNEETH RAM P	152023	R.M.K ENGINEERING COLLEGE,TAMIL NADU,THIRUVALLUR	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
967	Ministry of Mines	SIH1507	Hardware	11523	27953	BYTEHOGSS	PAPITHRA SELVI M	152016	PANIMALAR ENGINEERING COLLEGE,TAMIL NADU,THIRUVALLUR	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
968	Ministry of Mines	SIH1507	Hardware	26018	32159	Aqua Mystics	RAMPRASATH G	150596	P.S.N.A. COLLEGE OF ENGINEERING AND TECHNOLOGY, DINDIGUL,TAMIL NADU,DINDIGUL	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
969	Ministry of Mines	SIH1507	Hardware	41986	50446	UTHKARSHH	D GOUTHAMI	154381	MARRI EDUCATIONAL SOCIETY'S MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TELANGANA,RANGAREDDI	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
970	Ministry of Mines	SIH1511	Hardware	17260	16973	Abstract Cognition	GUDUR KRISHNA CHAITANYA	103254	THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA,PUNJAB,PATIALA	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
971	Ministry of Mines	SIH1511	Hardware	9906	17000	High Flyers 1310	VAIBHAV TIWARI	103254	THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA,PUNJAB,PATIALA	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
972	Ministry of Mines	SIH1511	Hardware	482	43510	Aurorans	SPURTHI.S.CHOUKIMATH	127354	BASAVESHWAR ENGINEERING COLLEGE, BAGALKOT,KARNATAKA,BAGALKOT	SELECTED	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
973	Ministry of Mines	SIH1511	Hardware	24759	46591	Byte-Ben-ders	SHUBHAM NAYAK	139656	VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE MATUNGA MUMBAI 400 019,MAHARASHTRA,MUMBAI	SELECTED FROM WAITLIST	Nalla Malla Reddy Engineering College,Telangana,Hyderabad

Winners List of SIH-2023 Grand Finale:

https://www.sih.gov.in/sih2023-grand-finale-result



SMART INDIA HACKATHON 2024 | HOME | ABOUT SIH | GUIDELINES | PROBLEM STATEMENTS | KNOW YOUR SPOC | PROJECT IMPLEMENTATION | FAQS | CONTACT US | SIH Finale Login

									411037,MAHARASHTRA,PUNE	
199	Ministry of Mines	SIH1507	Hardware	17199	41976	TECH MILLENNIALS	PUNEETH RAM P	152023	R.M.K ENGINEERING COLLEGE,TAMIL NADU,THIRUVALLUR	Nalla Malla Reddy Engineering College,Telangana,Hyderabad
200	Ministry of Mines	SIH1507	Hardware	41986	50446	UTHKARSHH	D GOUTHAMI	154381	MARRI EDUCATIONAL SOCIETY'S MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TELANGANA,RANGAREDDI	Nalla Malla Reddy Engineering College,Telangana,Hyderabad

Frequent Dislodgement of belt conveyor along hilly terrain for various reasons

Abstract

Belt conveyors in hilly or rugged terrains are prone to frequent dislodgement and misalignment due to factors such as uneven load distribution, environmental stress (rain, landslides), mechanical wear, improper tensioning, and structural misalignments. These failures not only cause significant downtime and financial losses but also pose safety risks. The proposed project aims to design a smart, real-time monitoring and predictive maintenance system that detects early signs of conveyor misalignment, wear, or structural instability using a combination of **IoT sensors**, **computer vision**, and **machine learning models**. This intelligent system will not only detect issues in real-time but also suggest preventive actions and alert maintenance teams for timely intervention.

Key Components

1. **Sensor Network for Monitoring**
    - **Accelerometers & gyroscopes**: Detect vibrations and tilt angles.
    - **Proximity sensors & encoders**: Monitor belt alignment and roller behavior.
    - **Tension sensors**: Measure belt tension across critical points.
    - **Weather and terrain sensors**: For contextual awareness (rain, soil movement, etc.).
2. **Computer Vision Unit**
    - Cameras placed at key points to **visually detect belt misalignment**, **damaged rollers**, or **material spillage**.
    - Real-time image processing using **OpenCV** or **TensorFlow Lite** on edge devices.
3. **Predictive Analytics Module**
    - ML models trained on historical sensor and image data to predict dislodgement or failure.
    - **Anomaly detection algorithms** to recognize unusual patterns in belt movement.
4. **Alert & Notification System**
    - Live status updates to control room.
    - SMS/Email/WhatsApp alert system for critical faults.
    - Mobile dashboard for quick field access.
5. **Structural Design Enhancements (optional)**
    - Recommend layout modifications, buffer zones, or smart idler placements to reduce misalignment.
6. **Integration Layer**
    - Can be integrated into existing **SCADA systems** or maintenance management platforms.
    - Export reports, logs, and predictions for audits.

Expected Outcome

- **Real-time detection** of misalignment, slippage, and mechanical anomalies.
- **Reduction in maintenance downtime** by shifting from reactive to predictive maintenance.
- **Improved safety** for workers and reduced operational risk in hilly terrain operations.
- **Mobile and web-based monitoring tool** for remote visualization and alerts.
- **Cost savings** by preventing major failures and optimizing repair schedules.
- **Customizability** for different terrain types and conveyor lengths.