









AT A GLANCE

The event focused on showcasing different technological trends in Signal Processing. Over the course of a two-day workshop, participants gained insights into the versatile applications of signal processing across various fields.

KPIs

We present to our valued readers a selection of noteworthy highlights and key accomplishments that significantly contributed to the event's resounding success.



139
Total entries recorded



12 HOURS
Scheduled Hours



9/10
Average Feedback assessed



Number of Experts



ARYABHATA AUDITORIUM

Silver Oak University



25th **26**th **AUGUST 2023** 09:30 AM - 05:30 PM

IEEE SPS NETSIP

The main objective of IEEE SPS NeTSiP is to provide a platform to create awareness on recent developments in Signal Processing and its applications to the latest technological developments.

ABOUT ROBOTICS AND AUTONOMOUS SYSTEMS

Robotics and Autonomous Systems are driving a technological revolution, merging AI and signal processing to enable independent task execution across industries. From enhancing efficiency and safety to raising ethical concerns about their societal impact, these systems shape the future of technology and human interaction.



MACHINE LEARNING



ARTIFICIAL INTELLIGENCE



INTELLIGENT SYSTEMS

BENEFITS

2

3

Exploration of Emerging Techniques

The event unveiled the latest paradigms, including Al-driven autonomous systems techniques, fostering fresh perspectives on signal processing and a culture of innovation.

Interdisciplinary Collaboration

It served as a bridge between various disciplines, encouraging collaboration among titan researchers and students through hands-on sessions, gaining invaluable connections among signal processing's evolving landscape.

Dissemination of Cutting-Edge Research

Beyond theoretical discussions, NeTSiP emphasized real-world applications and propelled avant-garde research into real-world applications, pushing industries and reshaping telecommunications, healthcare, and beyond.

Table Of		
Co	ntents	Page
01	About Event An overview of the event which includes the purpose, benefits and key takeaways and objectives.	01
02	Speakers A concise look at all the erudite luminaries that graced the event and shared their invaluable knowledge regarding various fields and signal processing.	02
03	Inaugration Ceremony Key moments from the inauguration cermony showcasing the grand start of the event.	03
04	Day 1 Report Describes all the important and vital moments of the Day 1 and insights imparted on the participants during the event.	04
05	Day 2 Report Describes all the important and vital moments of the Day 2 and insights imparted on the participants during the event.	13
06	Conclusion Describes the concluding moments during the closure of the event and the key takeaways acquired from all sessions.	17
07	Attendees Report Includes the final count of Number of Attendees by Category.	18
08	Feedback Summary Responses of the participants added as per the SPS Membership Event Organizer Guideline, provided by SPS.	19
09	Volunteer Credits Includes names of all vital volunteers which made the event successful with their various contributions.	21





About Event

NeTSiP is a **IEEE Signal Processing Society** initiative which aims to provide an opportunity for students, faculties, scientists, and engineers to interact with leading researchers in communication, speech, biometrics, and image and signal processing areas. It also includes invited talks from experts in these and related areas. It encourages people from different domains to participate in this program.

It plays a pivotal role in bridging the gap between academia and industry. By facilitating collaboration between researchers and practitioners, the society ensures that theoretical advancements find practical applications. This dynamic exchange is essential for the evolution and relevance of signal processing within real-world contexts.

It actively promotes networking and collaboration among professionals and students in the signal processing community. By fostering connections, the society nurtures an environment conducive to interdisciplinary interactions.

About Speakers



DR. ANGSHUL MAJUMDAR PROFESSOR, IIIT-DELHI





DR. NALIN
SHARMA
ASSISTANT PROFESSOR,
ABV-IIITM, GWALIOR



MS. JYOTIKA
ATHAVALE
PRESIDENT-ELECT, IEEE CS
DIRECTOR,
RAS ARCHITECTURE,
SYNOPSYS





DR. HARSHAL OZADIRECTOR R&D FOR
ROBOTECHMECH
SOLUTIONS PVT. LTD.



DR. TAPAS
KUMAR MAITI
ASSOCIATE PROFESSOR,
DAIICT, GANDHINAGAR





Deep Pragatya

The event commenced with a ceremonial Deep Pragatya and Saraswati Vandana, symbolizing the offering of blessings and good wishes for the event's prosperity and triumph. Subsequently, the program advanced, and the dignitaries engaged in felicitation rituals, demonstrating their esteem for one another through tokens of admiration and appreciation.

Dr. M.N. Patel was graciously invited to present a symbol of gratitude to the esteemed guest, Dr. Anil K. Roy. In a similar vein, Dr. Satvik Khara had the honour of extending a token of recognition to Dr. Chirag Paunwala. Likewise, Prof. Jaimin Dave was requested to felicitate Dr. Mita Paunwala with a symbol of admiration. Dr. Jay Dave, in a gesture of profound admiration, presented Dr. Manish Khare with a vibrant bouquet. Prof. Piyush Patel was called upon to convey his respect to Dr. Ashish Phophalia by presenting a bouquet, symbolizing deep appreciation.

In addition, Prof. Narendra Mahavadiya was honoured to present a bouquet to **Dr. Manisha Shah**, thus expressing a gesture of recognition and gratitude. Continuing with this tradition, Prof. Mayuresh Kulkarni proffered a bouquet to Prof. Shankar Parmar, while Prof. Digant Parmar was entrusted with showcasing admiration as he felicitated Dr. Priyesh Chauhan with a bouquet, underscoring the respect and acknowledgement for his contributions.

Dr. M.N. Patel then took the stage to share his insights, providing a guiding moment for the gathering. Soon after, esteemed figures Dr. Anil K. Roy and Dr. Chirag Paunwala also expressed their thoughts and emphasized the significance of NeTSiP for the Signal Processing Society.



Dr. Angshul Majumdar commenced the first session of the day, guiding the audience through the realm of Artificial Intelligence's impact on Drug Discovery. The focus was on Docking studies, which involve predicting interactions between small molecule ligands and protein targets. The four crucial phases of drug discovery and approval - Drug Discovery, Preclinical Research, Clinical Trials, and Drug Approval - were elucidated.

The discourse then transitioned to the Advantages and Limitations of Molecular Docking, expertly delivered by Mr. Majumdar. He proceeded to emphasize the significance of Pre-clinical research, which entails assessing the safety and efficacy of drugs in animals before human trials, accompanied by a discussion on Computational Drug Discovery, a methodology for identifying and designing novel drug variants. The session continued with illustrative accounts of successful drugs and ventured into the realm of Al-driven docking, Machine Learning's role in Drug Repurposing, and the classification of deep learning in comprehending intricate drug-target interactions. Noteworthy research papers by IIT Delhi on Al Computational Models during the pandemic were shared, underscoring their importance.

Concluding the session, students were motivated to actively participate in notable IEEE events, publish research papers, and engage in conferences. Subsequently, **Dr. Manish Khare**; Education Activity Chair, IEEE SPS Gujarat Chapter presented a memento along with a Letter of Appreciation to Dr. Angshul Majumdar, recognizing his commitment and unwavering contributions.



Moving forward, the second session was conducted by **Dr. Harshal Oza**. He commenced his discourse with the topic "ML-AI Use Cases, Challenges & Results: Industry Perspective for Robotics." Dr. Oza adeptly navigated the disparity between industry and academia, delving into the realm of production-ready designs that encompassed vital facets such as reliability, availability, and safety, as well as considerations like vibration, temperature, and Ingress protection.

Throughout the session, Dr. Oza illuminated key concepts like Mean Time To Failure (MTTF) and expounded upon 'The Paradox,' which encapsulated the intriguing transition of research into dependable engineering solutions. He astutely articulated the divergence between research and engineering, encapsulating engineering as a discipline rooted in reliability while casting research as a frontier-pushing endeavour.

The significance of production readiness and the intricacies of conveyor tracking was vividly conveyed, exemplified through a juxtaposition of Parle's Production Plant and a prototype by CSIR. The audience was guided through the technology readiness levels (TRL) and the role of Quality Inspection Cells.

The culminating segments of Dr. Oza's presentation delved into the pragmatic applications of ML-AI, encompassing Anomaly Detection, Metrology, Counting, Sorting, Quality Inspection, and Predictive Maintenance. This exposition left the audience deeply inspired and invigorated. Following the session, **Prof. Shanker Parmar**; Technical Talk Series Co-ordinator, IEEE Gujarat Section, honoured Dr. Oza with a commemorative token and a Letter of Acknowledgment, expressing heartfelt appreciation for his enlightening contribution.

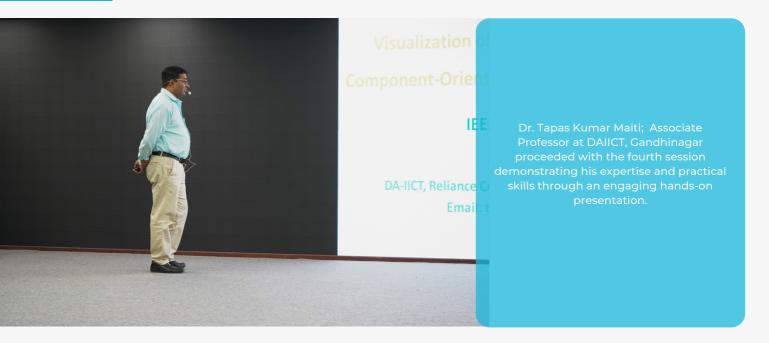


The third session began after lunch, with the anchor inviting to the stage speaker, **Dr. Tapas Kumar Maiti**. The session's focus was on "Visualization of Robot Movement Based on the Component-Oriented Model for the Embedded World." Attendees were immersed in the realm of robotics, as Dr. Maiti provided an introduction to "Diverse Robots and Their Key Components."

To foster a deeper comprehension, participants were guided by the speaker through a comprehensive analysis. Dr. Maiti elucidated the segmentation of models across various domains and offered profound insights by visually depicting operational efficiency. He elaborated on model parameters and the Analog and digital software framework. Notably, he detailed on the utilization of tools such as MATLAB for Co-Simulation, actively encouraging practical engagement.

Beyond delving into robotics and the embedded sphere, the speaker enlightened the audience about ML-Al Controllers. Vivid real-world instances were presented to illustrate Machine Learning applications.

Dr. Maiti engaged the participants by elucidating the Neural Network Model's "Multiple Inputs and Multiple Outputs" configuration. He captivated attention by sharing invaluable advice on programming language implementation. In his closing remarks, he expounded upon the techniques employed in robot-component-oriented modelling, simulation, and visualization via circuits. Overall, the session immensely benefited the attendees, equipping them with invaluable insights and knowledge.



The fourth session was continued by **Dr. Tapas Kumar Maiti**, who conducted an interactive workshop on visualizing robots and their functionality practically. The workshop focused on utilizing the "VMware Workstation Player" software, with participants being guided through its basics. Various robotic software types and their real-world applications were explored, accompanied by live examples.

During the hands-on segment, participants engaged with the 'ROSS' software, which facilitates the virtual testing of robotic components. This capability enables developers to optimize their robots' performance before physical deployment. Dr. Maiti, leveraging his profound robotics expertise, presented an informative talk on the software packages available. Participants were guided step-by-step in creating and installing a new package within a workspace. Dr. Maiti's personal interaction provided valuable troubleshooting assistance.

The session delved into the practical application of proportional and speed controllers, enriching participants' comprehension of virtual robot design. The presentation culminated in Dr. Maiti elucidating the five levels of the Robot Operating System. The event concluded with **Dr. Manish Khare**, Education Activity Chair of IEEE SPS Gujarat Chapter, expressing appreciation by presenting Dr. Tapas Kumar Maiti with a memento and an acknowledgment letter.



A glance of the online session by Ms.

Jyotika Athavale; President-Elect, IEEE CS

Director, RAS Architecture, Synopsys being introduced to the participants.

Session 5

The first day's session concluded with an online presentation by Ms. Jyotika Athavale, during which she unveiled several significant IEEE standards spanning diverse technology domains. The audience was introduced to the IEEE ML-Al standard, which centered around imbuing machines with human-like cognition, and the IEEE software development life cycle standard, aimed at streamlining software creation processes.

The session extensively covered the realm of robotics, emphasizing the importance of standardized practices to ensure safe operations across various applications. A key concept introduced was that of "domain and field agnostic standards," highlighting the adaptability of these standards across a wide spectrum, from medical applications to space technology.

Notably, the session also focused on IEEE P2851 standard for its versatility in handling functional safety data across different domains, facilitating interoperability within complex dependency life cycles.

Throughout the session, the significance of collaboration and liaison between different standards was underscored, emphasizing how working together can lead to comprehensive and effective outcomes.

The session's interactive Q&A segment provided insightful exchanges, further enhancing the audience's understanding. In recognition of her valuable contribution, Ms. Athavale was honored with a **virtual memento**, symbolizing deep appreciation for her efforts in conveying intricate concepts in an accessible manner to a diverse audience.

NeTSip2023

→ IEEE SOU SPS SBC

Day 1

Session 1

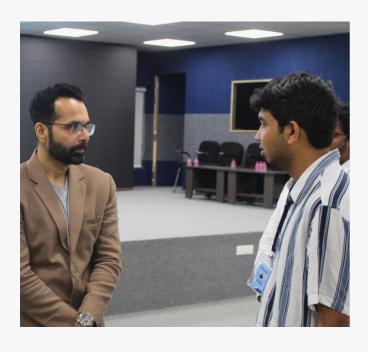




A glimpse of participants engrossed in the session.



Dr. Manish Khare; Education Activity Chair, IEEE SPS Gujarat Chapter proffering a heartfelt memento to the esteemed speaker Dr. Angushul Majumdar; Professor IIIT- Delhi.





Participant inquiring with the speaker on a one to one basis.



Dr. Angshul Majumdar taking a session on Computation Drug Discovery.



→ IEEE SOU SPS SBC

Day 1

Session 2



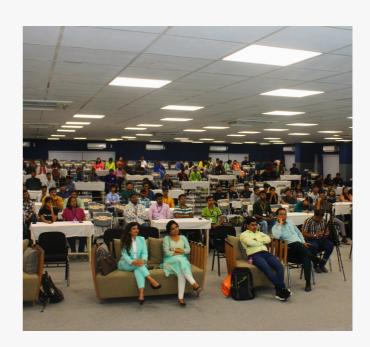


A gander of Second Session by Dr. Harshal Oza on ML-Al use cases.



Prof. Shanker Parmar; Technical Talk Series Coordinator, IEEE Gujarat Section, honoring Dr. Harshal Oza with a commemorative memento.





Dr. Harshal Oza engaging in an interactive discourse.



An illustrative image capturing all the attendees, dignitaries in the audience, thoroughly engrossed in the session.



Day 1

Session 3 & 4

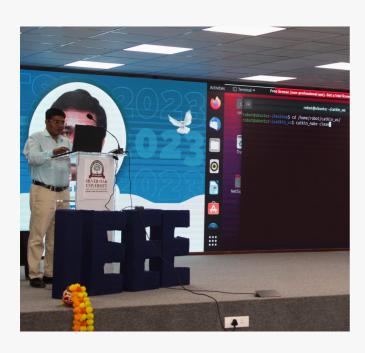


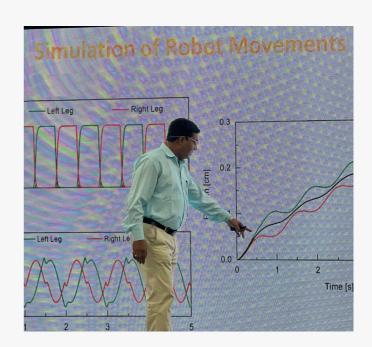


Dr. Tapas Kumar Maiti providing assistance to participants during hands on session.



Dr. Tapas Kumar Maiti being proffered a memento by Dr. Manish Khare; Education Activity Chair of IEEE SPS Gujarat Chapter.





Dr. Tapas Kumar Maiti coding during a practical instructional session.

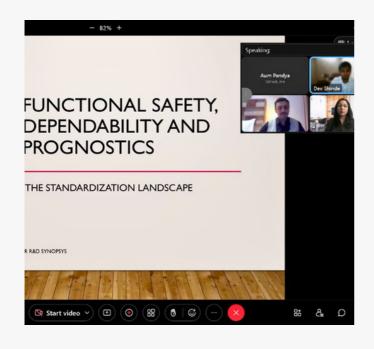


The expert Dr. Tapas Kumar Maiti explaining Neural Network Model Configuration.



Day 1

Session 5

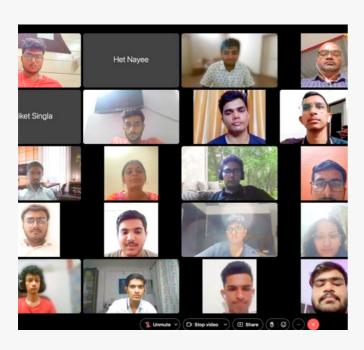


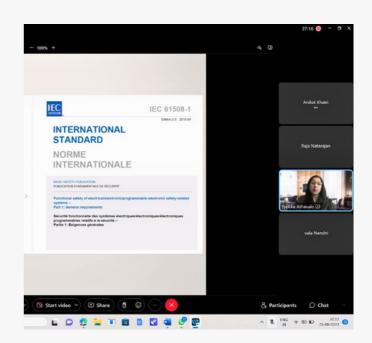


Online session of Ms. Jyotika Athavale; President-Elect, IEEE CS, Director, RAS Architecture, Synopsys.



Ms. Jyotika Athavale being felicitated by an E-Memento as a token of gratitude.





A glimpse of participants attending the online session.



The expert Ms. Jyotika Athavale explaining the attendees about International Standard.



The excitement of day two unfolded with an enthralling session led by the esteemed **Dr. Nalin Sharma**. The journey commenced with an exploration of Intelligent Transportation Systems, sparking curiosity for a future characterized by secure and eco-friendly mobility. With finesse, Dr. Sharma unraveled the intriguing interplay of "Man Vs. Machines," immersing the audience in the realm of autonomous systems. However, the discourse did not stop there; it transitioned seamlessly into the electrifying world of Electric Vehicles (EVs).

In response to the escalating crude oil prices in India, Dr. Sharma passionately redirected his research towards Electric Vehicles (EVs), meticulously assessing their economic viability in comparison to conventional vehicles. He ardently acknowledged their pivotal role in mitigating environmental impact. His innovative approach centered around energy-efficient designs and intelligent braking systems, introducing pioneering concepts like platooning to enhance vehicle efficiency. Advanced techniques such as Model-Based Reinforcement Learning were deftly employed for precise control and speed prediction.

In essence, Dr. Sharma's work elevated transportation research by offering pragmatic solutions to mobility and environmental challenges, leaving an indelible impact on the audience. The enlightening session culminated with **Dr. Manish Khare**, Education Activity Chair of IEEE SPS Gujarat Chapter, honoring Dr. Nalin Sharma with a memento and an appreciative letter.



In an electrifying finale, the second session was masterfully orchestrated by the visionary **Dr. Mehul Raval**, where he shed light on the transformative potential of computer vision in sports data analytics. He took the participants on a journey through topics such as precision game analysis, tactical insights, visualisation, and injury risk minimization.

Dr. Raval delved into basketball, elaborating on the concept of injury risk protection. He underscored computer vision's unparalleled contribution in safeguarding athletes from potential injuries while emphasising how computer vision acts as a facilitator of player movement analysis, fueling data-driven decision-making in sports. Real-time insights into player actions and interactions were also shared that became the cornerstone of strategic planning and tactical execution as it helps teams with a competitive edge.

Through vivid examples the importance of multi-camera setups and 3D modelling for precision tracking of body positions, joint angles, and movements, essential for deriving actionable conclusions were explored. Dr. Mehul Raval's captivating practical demonstrations held the audience spellbound, granting them first hand exposure to the remarkable capabilities of computer vision.

Convening the session, **Dr. Mita Paunwala**; Vice-Chair at IEEE Signal Processing Society Gujarat Chapter presented a Letter of Appreciation along with a memento to acknowledge Dr. Raval's dedication and invaluable contributions to the event.



IEEE SOU SPS SBC

Day 2

Session 1





Students engaging in an interactive auditory experience during the session.



Dr. Nalin Sharma being felicitated a memento by Dr. Manish Khare; Education Activity Chair of IEEE SPS Gujarat Chapter.





Dr. Nalin Sharma alongside the participants captured within a single frame.



Dr. Nalin Sharma adeptly expounded upon the application of Model-Based Reinforcement Learning.



→ IEEE SOU SPS SBC

Day 2

Session 2





Dr. Mehul Raval extending a gracious introduction to the esteemed participants, presenting himself with a blend of formality and distinctiveness.



Dr. Mita Paunwala; Vice-Chair at IEEE SPS Gujarat Chapter bestowing memento upon Dr. Mehul Raval.





An overview of all participants engaged in the comprehension of the elucidated subjects.



Dr. Mehul Raval illuminating his comprehensive perspective on Computer Vision in Sports Data Analytics.

Conclusion

The event brought together a diverse array of professionals, experts, and enthusiasts, fostering a dynamic environment for the exchange of knowledge, insights, and groundbreaking ideas.

It had a profound impact on participants, enhancing their understanding of signal-processing concepts and methodologies. Attendees lauded the event's comprehensive approach, which harmoniously integrated theoretical insights with practical applications. The engagement with keynote speakers, the interactive and technical sessions collectively contributed to a holistic learning experience.

The event played a pivotal role in pushing the boundaries of their knowledge, allowing them to explore advanced topics, challenge existing paradigms, and gain exposure to innovative approaches. The interactive nature of the event fostered an environment where attendees felt encouraged to ask questions, share their insights, and engage in discussions that expanded their perspectives.

The success of this event stands as a testament to the power of knowledge dissemination and collective pursuit of excellence within the realm of signal processing.

Attendees Report



NUMBER OF ATTENDEES BY CATEGORY

Students / Research Scholar Student:

- 1. Non-Member Student / Research Scholar Student = 72
- 2. SPS Student Member = 67

Professional/ Research Scholar Professional:

1.IEEE Member = 1

Feedback Summary

This section contains the feedback asked as per the SPS Membership Event Organizer Guideline, provided by SPS. The quotes in this report are extracted from the feedback forms that the participants were asked to fill out and submit to the organizers at the end of the event.

OVERALL, HOW SATISFIED PARTICIPANTS WERE WITH THIS EVENT?

Overall, the coordination and arrangements of the event were highly appreciated by the participants. The purpose, results, and outcomes were regarded as relevant and meaningful. Considering the overall feedback from the participants, they were moderately satisfied with the event.

WERE THE PARTICIPANTS INTERESTED IN ATTENDING A FOLLOW-UP EVENT NEXT YEAR ON A RELATED TOPIC?

Participants appreciated and showed their utmost interest in the follow-up event next year on a related topic.

RESPONSES FROM THE SPACE PROVIDED FOR ANY ADDITIONAL COMMENTS.

- 1. Arrange session on financial market.
- 2. Great teamwork.
- 3. This event is such a knowledgeable event to us. Thanks for this event IEEE.
- 4. Management is proper and good.
- 5. Overall, very good.
- 6. It was quite a good experience.
- 7. Overall good but can be better with practical practice.
- 8. Certification should be provided through some Qualification Exam or Criteria.
- 9. Thanks for give this opportunity.
- 10. I have really enjoyed the event and especially the foods were delicious.
- 11. Thanks for the event.
- 12. I hope IEEE keeps organizing such events.
- 13. The sessions were amazing.

Feedback Summary

SOME RESPONSES OF WHAT THE PARTICIPANTS LIKED ABOUT THIS EVENT.

- 1. It was very insightful and the knowledge shared was exceptional.
- 2. Arrange more events like that.
- 3. Interactive Sessions.
- 4. Management and speaker and such knowledgeable atmosphere.
- 5. Intellectual and knowledgeable event.
- 6. I have learnt and explore more about Robotics and Autonomous Systems. And meeting new students with same mindset.
- 7. This event was very deep and clear knowledge about latest cutting-edge technologies.
- 8. It was very informative, and, in this session, I understand new words and term of technical world.

PARTICIPANTS' FEEDBACK ON WHAT THEY THINK COULD BE IMPROVED.

- 1. Just more about the management.
- 2. The things we want in seminar has already prepared before the seminar, so not issue in the seminar.
- 3. To include more live practicals.
- 4. Practical implementation of Code.
- 5. Time management.
- 6. Everything was perfect.
- 7. More of practical practice than theory lesson.
- 8. The speakers could be more interactive and less of PPT reading could have been done.
- 9. Speakers could have been more demonstrative in their presentation.
- 10. More workshops should happen in these types of events.
- 11. Can Focus more on Coding for Beginner.
- 12. It should be more beginner oriented and should have more hand-on part.

Volunteer Credits

Event Head

Divyesh Patel Aayush Nanda Aum Pandya Aayush Parikh Siddh Bhavsar Om Patel

Co-Head

Abhay Pisharodi Hotri Trivedi Rushi Prajapati Jeel Vekariya Viraj Modi Meet Suthar Gautam Patidar Aniket Khatri

Creative

Vimarsh Tiwari Prashant Chettiyar Gautam Patidar Snigdha Joshi

Designing

Gautam Patidar Prashant Chettiyar Meet Suthar

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Siya Acharya Patel Daksh

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Shreshang Thakor
Deepam Makwana
Humera Shaikh
Aayush Parikh

Budget

Viraj Modi Jeel Vekariya

Eatables & Refreshments

Om Patel Aayush Nanda

Volunteer Credits

Curation

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Chitt Bhavsar

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Kenil Ramani Swabhiman Nanda Drashti Patel Aayush Parikh

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Ayush Nanda Aum Pandya Chitt Bhavsar Atharva Ambedkar Khant Patel Parth Panchal Simran sadhna Jeel Vekariya MohammedAmman Chopadiya Abhay Mandli Drashti Patel Rai Patel Mohite Mithil Swabhiman Nanda Siddh Bhavsar Kishan Panchal Hemil Panchal Manthan Vachani

Technical

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Jil Upadhyay
Anurag Soliya
Nimit Patel
Gaud ShwetKamal
Khush Patel