

A REPORT ON
**Advances in VLSI Based Signal Processing
and Applications**

Date: 26th June, 2021

Platform: Cisco WebEx Meeting

IEEE Signal Processing Society Gujarat Chapter
presents

Expert Talk Series in collaboration with
IEEE Bombay Section and IEEE SPS Silver Oak University SBC

*Advances in VLSI based signal
processing and applications.*

June 26, 2021 | 10 AM IST

Scan to Register



**Dr. Satyanarayana
Bheesette,**
*Scientific Officer (H),
TIFR, Mumbai*



<https://forms.gle/oZPVSpBwZfcAqs2b7>
(WebEx link will be sent to registered participants)

Introduction

In accordance with the mission and vision of IEEE Signal Processing Society, Gujarat Chapter aim to provide the best possible technical upliftment to its members and keep them acquainted with the latest information and trends of Signal Processing.

Keeping this motto in view, an expert talk on “Advances in VLSI Based Signal Processing and Applications” was organized by IEEE SPS GUJARAT CHAPTER in collaboration with IEEE SPS BOMBAY SECTION and IEEE SILVER OAK UNIVERSITY SPS SBC under the Technical Talk Series 2021 with a unique guide about development and advances in VLSI technology.

About the Speaker

For this session, we had an expert and an experienced speaker, Dr. Satyanarayana Bhesette. He did his B.Tech in Electronics and Communication Engineering from J.N.T University, Hyderabad, and Ph.D. in Physics from IIT Bombay. He has been working in the Department of High Energy Physics, Tata Institute of Fundamental Research (TIFR) since 1983 – and is currently a Scientific Officer (H) and Coordinator of the INO Project. Dr. Satyanarayana sir has published about 250 research papers and proceedings in national and international journals and conferences, besides scores of invited talks. His very first paper won the best paper award from the Institution of Electronics and Telecommunication Engineers (IETE). Recently he was honoured with Homi Bhabha Award in Science Education (HBASE-2020) and has been selected as AICTE-INAE Distinguished Visiting Professor at the Symbiosis Institute of Technology, Pune. He is also a Senior Member of IEEE, currently an Executive Committee member and Vice-Chair of the IEEE Bombay Section as well as the Chair of IEEE Bombay section. He won IEEE Bombay Section’s Outstanding Volunteer Award for 2014 and IEEE Head Quarter’s MGA Achievement Award for 2016.

About the Session

Date: 26th June, 2021

Time: 10:00 PM to 12:00 PM IST

Platform: Cisco WebEx Meeting

Participants: 143

The event began at 10 A.M. after the welcome speech, Dr. Chirag Paunwala who is the Chair of IEEE Signal Processing Society Gujarat Chapter, the Regional Director at Large candidate for R10, nominated by the Board of directors of IEEE SPS shared a few things about Gujarat Section its events and speakers. After his wise words, Prof. Viren Patel, Faculty Coordinator of Silver Oak University IEEE Student Branch was invited to brief the participants about the speaker, Dr. Satyanarayana Bhesette. Starting with the event Dr. Satyanarayana Sir explained about Sensor Signal Processing, Issues of Sensor Signal Production like duration, Linearity, Reproductivity, and Ageing.

He also threw some light on Industry Standard Integrated Circuit (ISIC), Application Specific Integrated Circuit (ASIC). He further explained how the Intellectual Property (IP) can be built into the FPGA fabric to provide rich functionality, also discussed the Intel FPGA IP Ecosystem, and many more. He also expressed the current scenario in VLSI and also mentioned India's position in this technology.

Conclusion

An expert Q&A session followed after the event's conclusion, during which attendees asked the questions. And all the doubts were solved thoroughly. Later, Prof. Yeshudas Muttu, Vice-Chair, TPAC, IEEE Bombay Section presented the vote of thanks to our esteemed speaker. We thanked speaker Dr. Satyanarayana Bhesette for such an insightful session and we were honoured to extend our gratitude by presenting a memento to the Sir. We thanked him on behalf of the IEEE SPS GUJARAT CHAPTER, IEEE SPS BOMBAY SECTION, and IEEE SILVER OAK UNIVERSITY SPS Student Branch Chapter.

Last but not least, we thanked all the enthusiastic participants and committee members for attending and making this session successful.

Some glimpse of the event



The screenshot displays a Zoom meeting interface. The main content area shows a presentation slide titled "Activities under SPS, GS" with the IEEE logo. The slide lists several activities:

- Distinguished Lecturers (DL) and Distinguished Industry Speakers (DIS) Talks**
- NeTSIP (New Trends in Signal Processing)**
 - Flagship event in collaboration with DAIICT, Gandhinagar, Gujarat, India
- Technical Talk Series**
 - Intending to bring eminent experts in the field of Signal Processing, Machine/Deep learning, and Wireless Communications to provide a platform for budding engineers and professionals to be benefitted from the experts
- Women in Signal Processing**
 - Aims to increase and promote visibility and recognition of women in signal processing fields
- YP Activities**
 - This program is committed to help young professionals to evaluate their career goals, enhance early career skills and boost professional network

The right sidebar shows a list of 36 participants, including names like Wuzhif Shah, Arpan Desai, Chirag Ranwar, Dr. Satish Khosla, Prof. Yeshudas Muttu, and Satyanarayana Bhesette. The bottom of the screen shows the Zoom control bar with options like Unmute, Stop video, Share, and Breakout sessions, along with a Windows taskbar at the very bottom.

Zoom Meeting Meeting Info Show Menu Bar

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Issues of sensor signal production

- ❖ **Duration**
 - Depends on the type of physical process exciting the sensor and details of signal production process in the external circuit
- ❖ **Linearity**
 - Most sensors are characterised or chosen for linearity
 - Commercial components can expect non-linearity, offset and possible saturation
- ❖ **Reproducibility**
 - Many signals are temperature dependent in magnitude - mobility of charges, other effects easily possible as well
- ❖ **Ageing**
 - Sensor signals can change with time for many reasons
 - Natural degradation of sensor, variation in operating conditions, ambient parameters, etc.
- ❖ **All these issues mean that one should always be checking or calibrating measurements intended for accuracy, as best as one can.**

Dr. B.Satywanarayana, TIFR, Mumbai Expert talk series, IEEE Signal Processing Society, Gujarat Chapter (Online) June 26, 2021

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11:04 AM 26/06/2021

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Reorienting imaging sensors for COVID-19

- ❖ Hamamatsu manufactures a wide range of off-the-shelf and custom OEM photonic solutions currently employed in the global effort to detect, monitor, treat and ultimately defeat the COVID-19 global pandemic.
- ❖ They are currently ramping up manufacturing to support specific applications that are making a difference including real-time PCR, antibody testing, X-ray and CT imaging, digital pathology and broader research applications like genotyping and next generation sequencing.

Photo sensors and components for PCR

Photo components for immunoassay and antibody pHc tests

Photo components for X-ray systems

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