

Report on
Expert Talk under IEEE Education Week



Expert: Mr Umesh Shah

April 20th 2024

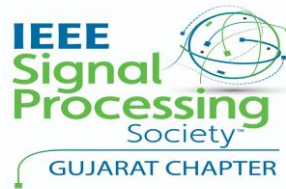
Title: AI in Healthcare

**IEEE Signal Processing Society, Gujarat Section in
collaboration with IEEE SCET SPS SBC, and IEEE CKPCET SPS
SBC**



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✚ Poster for the talk

IEEE Signal Processing Society
CKPCET STUDENT BRANCH CHAPTER

IEEE Signal Processing Society
GUJARAT CHAPTER

IEEE Signal Processing Society
CKPCET SB
CELEBRATING 75 YEARS

IEEE Signal Processing Society Gujarat Chapter
IEEE Education Week 2024



Mr. Umesh Shah
Director of Design Assurance
at Abbott Labs.

IEEE Education Week

Expert Talk
in Collaboration with
IEEE SCET SPS SB and IEEE CKPCET SPS SB

AI in Healthcare

20 April 2024 | 10:30 AM IST
Scan to Register



(GoogleMeet link will be sent to registered participants)

 ieeespsgs.org/

   [ieeespsgs](https://ieeespsgs.org/)

✚ Expert Profile



Expert: Mr Umesh Shah

(Director of Design Assurance at Abbott Labs)

✚ Introduction:

With a commendable track record spanning over 15 years in the medical device industry, Umesh Shah emerges as a seasoned leader renowned for his prowess in ensuring product quality and regulatory compliance. Armed with a Master of Science degree in Electrical Engineering from California State University, Northridge, Shah brings a formidable blend of academic rigor and practical expertise to his role. Currently serving as the Director of Design Assurance at Abbott Labs, Shah's contributions are pivotal in steering the company towards excellence in quality development. His strategic leadership and comprehensive understanding of crucial domains such as Verification and Validation, Design Control, and Risk Management underscore his instrumental role in upholding Abbott Labs' unwavering commitment to maintaining the highest standards of quality and regulatory adherence. Let's delve deeper into the multifaceted journey and notable achievements of Umesh Shah in the dynamic realm of medical device innovation and regulation.

Glimpses of the Talk

RISK NEEDS TO CONSIDER BY MEDICAL DEVICE MANUFACTURER

- Learning**
 - How device able to adjust its performance over time?
 - Data Quality
 - Adversarial attack
 - Bias, labeling, feature etc.
- Autonomy**
 - What autonomy function does the system provide?
 - What level of autonomy?
- AI Model & Interpretability**
 - Does the software provide diagnosis or treatment recommendation?
 - How significant is the information?
- Other**
 - Potential of false use of the device?
 - User consent of use

AI IN MEDICAL DEVICE

Challenges for Medical Device

- Reliability**
 - Consistent output in similar situations and in different situations
 - Consistent output in different situations
 - Consistent output in different situations
- Interpretability**
 - Consistent output in different situations
 - Consistent output in different situations
 - Consistent output in different situations
- Robustness**
 - Consistent output in different situations
 - Consistent output in different situations
 - Consistent output in different situations

Conclusion

- Consistent output in different situations
- Consistent output in different situations
- Consistent output in different situations

FDA PUBLISHES LIST OF AI-ENABLED MEDICAL DEVICES

2/7/20 FDA Authorizes Marketing of First Cardiac Ultrasound Software That Uses Artificial Intelligence to Guide Users
Caption Guidance**

4/9/21 FDA Authorizes Marketing of First Device That Uses Artificial Intelligence to Help Detect Potential Signs of Colorectal Cancer
Caption Guidance**

9/2/21 FDA Authorizes Software that Can Help Identify Potential Cancer
Caption Guidance**

Overlay of FDA's TPLC Approach on AI/ML Workflow

Good Machine Learning Practices

- Data selection and management
- Model training and tuning
- Model validation
- Model deployment
- Model monitoring

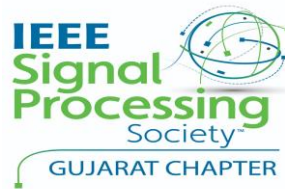
FDA: PROPOSED REGULATORY FRAMEWORK FOR AI-ENABLED DEVICE SOFTWARE

AI IN HEALTHCARE MARKET HIGHLIGHTS

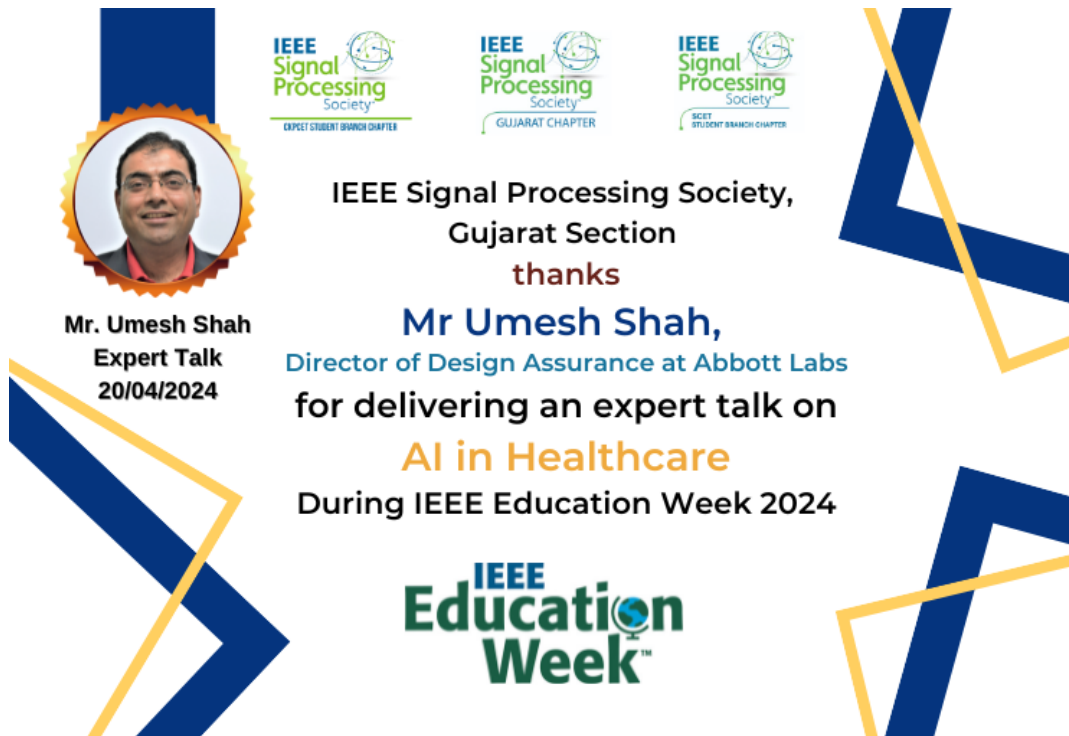
SEGMENT	SUBSEGMENT
By Offering	Hardware, Software, Services
By Technology	Machine Learning, Deep Learning, Generative AI, etc.
By Application	Medical Imaging, Drug Discovery, etc.
By End User	Hospital and Healthcare Providers, etc.
By Region	North America, Europe, Asia-Pacific, etc.

BRANCHES OF ARTIFICIAL INTELLIGENCE

- Artificial Intelligence**
 - Machine Learning
 - Deep Learning
 - Generative AI
 - Foundation Model
 - Large Language Model



Memento



Number of Participants

Total: 145

IEEE Members: 54

NON-IEEE Members: 91

Report Prepared by: Shankar Kantilal Parmar