Shrihari Viswanath

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Summary

Med Tech inventor from GE HealthCare trained in Electronics and Instrumentation engineering at BITS Pilani. Rich experience in ultrasound sensing, signal processing, AI/ML, maternal and fetal health.

Education

Birla Institute of Technology and Science, Pilani, Rajasthan
Bachelors in Engineering, Electronics and Instrumentation (2016-2020)

- Graduated 1st Class. Awarded 10/10 for BE dissertation. One of first six Institutes of Eminence identified by the Government of India with an acceptance rate < 2%.

General Electric
Edison Engineering Development Program (2020-2022)

- Elite (top 5% worldwide) technical leadership development program for engineering recruits with a 100-year legacy. Completed GE's Advanced Courses in Engineering and executed projects in 3 different verticals.

Experience

General Electric HealthCare, Bengaluru
Electronics Design Engineer (Oct 2022-Present)

- Maternal & Fetal Monitor: Lead designer for the Ultrasound sensor. Advanced product launch by 3 months potentially preserving $21M in revenue and retaining market leader position. Driving electronic design, transducer optimization and signal processing for wireless fetal sensors.
- Patch ECG System: Preterm Labor algorithm development and biostatistical-analysis (for 510(k)).

General Electric HealthCare, Bengaluru
Edison Engineer (Oct 2020-Oct 2022)

- Ultrasound Fetal Sensor: Miniaturized and redesigned an RF-Analog front end to improve SNR.
- Patch ECG System: Designed & implemented an IR interface module & a wireless charger for the Novii Patch. Was made responsible for new designs & design changes on the Novii Pod.
- Anesthesia Delivery System: Overall firmware development and architecting the communication framework for the reliability-critical Power Management Platform.

TU Munich - TranslaTUM, Munich
Research Student (July 2019 - Dec 2019)

- Bachelor's thesis at Dr. Oliver Hayden's lab for biomedical electronics. Developed a high throughput incubator for accelerating cancer studies. Designed the chamber, implemented a control system to regulate ambient parameters and integrated with a benchtop pipette robot.

General Electric HealthCare, Bengaluru
EID Intern (May 2019 - July 2019)

- Developed prototypes for a near field communication-based connectivity module (to help wireless sensors automate secure simple paired Bluetooth connections)

Central Electronics Engineering Research Institute, Chennai
Research Intern (May 2018 - July 2018)

- Devised a miniature (for a wrist watch form factor) Reflective Photoplethysmography module at Dr. Bala Pesala's lab to enable arrhythmia detection in resource constrained settings.

Inventions

- **S. Viswanath**, R. Naik, "Hybrid TDM and FDM for Improving Depth Coverage and Power Reduction while ensuring Coexistence in an Ultrasound Fetal Monitoring System" 2023. *GEHC Invention Disclosure 701045, US Patent Application (Patent ID: 90289267).*
- **S. Viswanath**, R. Naik, A. Benoy, "Pulse Schemes and Artifact Elimination for Ultrasound Coexistence in a Multi Transducer Fetal Monitoring System" 2023. *GEHC Invention Disclosure 701052, US Patent Application (In submission).*
- **S. Viswanath**, R. Naik, A. Benoy, "Power Reduction of Fetal Ultrasound Transducers" 2023. *GEHC Invention Disclosure 701036, US Patent Application (In submission).*
- **S. Viswanath**, N. Raja, R. Naik, "Tocometry Transducer Patches and a Smart Fetal Sensing System" 2023. *GEHC Invention Disclosure 701155, US Patent Application (In submission).*

- K. Manickam, **S. Viswanath**, R. Naik, "Half-Counting Double-Counting Supervisory Control and Real Time Signal Processing Techniques for FHR detection" 2023. *GEHC Invention Disclosure 701208, US Patent Application (In submission).*
- K. Manickam, **S. Viswanath**, R. Naik, "Novel Peak Detect Algorithm" 2023. *GEHC Invention Disclosure 701122, Trade Secret - Critical to Business.*
- N. Raja, **S. Viswanath**, R. Naik, "Skin sensor detachment detection for smarter alarms in the NICU" 2023. *GEHC Invention Disclosure 701062, US Patent Application (Under Evaluation).*

Publications

- **S. Viswanath**, K. Manickam, "CNN and Hybrid LSTM Methods for Fetal Acidemia Detection using Fetal Heart Rate Trends" - *In preparation for submission to IEEE Transactions on Biomedical Engineering.*

Projects

- **2021**: DICOM Imaging Platform: Built a DICOM viewing & database mgmt. platform along with an U-Net based AI tool for brain MRI segmentation. Deployed as dockerized microservices at GE.
- **2020**: AI for Glaucoma Detection: Created a neural network-based algorithm for fundus images designed to detect glaucoma. Awarded highest grade at BITS Pilani for the project-based course.
- **2020**: COVAID App: Designed and demonstrated an end-to-end android application to help shop owners and users track real time crowd counts in order to manage social distancing norms.
- **2019**: MRI Bone Segmentation: Designed a heuristic thresholding edge detection algorithm and an active contouring-based algorithm on MATLAB for bone segmentation in MRI images.
- **2018**: Structural Health Monitoring (SHM) Toolbox: Created a toolkit for analysis and conditioning of time series SHM data using wavelet transforms, fourier transforms, and machine learning.

Offices Held

Coordinator (Head)
Department of Photography, Student Union, BITS Pilani (Jan 2019 - May 2019)

- Led a 45-member photography department at BITS with the responsibility to plan, operate and generate revenue by offering photography/ visual design/ memorabilia services for the national collegiate festival. Highest revenue generated by a student led department.

Member of Election Commission
Student Society for Mess Services, BITS Pilani (August 2018 - May 2019)

- Conducted impartial elections for the Mess Society (responsible for all food services on campus; budget ~ $2M/yr). Exercised regulatory oversight over the governing body and vendors.

Honors

- **2023**: Finalist (top 3 of 100) under Entrepreneurial Spirit Category, GE HealthCare India Tech Awards.
- **2021-23**: Received 4 Impact Awards for Contributions and Achievements at GE HealthCare.
- **2018**: Semifinalist amongst 26,000 applicants in the India Innovation Challenge Design Contest conducted by DST (Government of India), Texas Instruments & IIM-Bangalore.
- **2018**: Winner of a nationwide Innovation Challenge, conducted by Rolls-Royce for system design and engine airframe integration concept of a hybrid aircraft.
- **2017**: Runner-up in APOGEE, the national technical festival at BITS (for designing and demonstrating an automated humidifier for textile industries)
- **2015**: Selected for the prestigious KVPY Scholarship of the Govt. of India. Rank 1347 of over 150,000 applicants.

Scores

GRE - 332/340; TOEFL - 112/120

Skills

Electronics & Computing: Circuit Design; Digital Signal Processing; AI/ML
Simulation: SPICE; Simulink; COMSOL; Cadence (Design)
Programming: MATLAB; Python; C; C++; VHDL
Others: DFX; FMEA; IEC; ISO; US-FDA

Others

Languages: English, Hindi, Tamil, Sanskrit (Elementary)
Other Interests: Guitar; Composing Music; Soccer; Trekking; Photography; Reading