

# Deep Pujara

Tempe, AZ | [dpujara1@asu.edu](mailto:dpujara1@asu.edu) | +1 (480) 791-7438 | <https://www.linkedin.com/in/deep07-pujara/> | [My Website](#)

## SUMMARY

Ph.D. student at Arizona State University with a focus on Solar, Signal Processing, and Embedded Machine Learning (ML). Experienced in hardware and software development, with a track record of IEEE publications, internships in industries and research organizations, awards, and a notable presence in industry meetings and hackathons, seeking a challenging position to showcase my skills.

## EDUCATION

<b>Doctor of Philosophy in Electrical Engineering</b>	<b>(Jan 2024 – Present)</b>
<ul style="list-style-type: none"><li>Arizona State University, Tempe, Arizona, USA</li><li>Specialization: Solar, Signal Processing, and Embedded Machine Learning</li></ul>	(GPA: 3.83/4)
<b>Master of Science in Electrical Engineering</b>	<b>(Aug 2021 – Dec 2023)</b>
<ul style="list-style-type: none"><li>Arizona State University, Tempe, Arizona, USA</li><li>Specialization: Solar, Signal Processing, and Machine Learning</li></ul>	(GPA: 3.82/4)
<b>Bachelor of Technology in Electronics and Communication Engineering</b>	<b>(August 2017 – May 2021)</b>
<ul style="list-style-type: none"><li>Nirma University, Ahmedabad, Gujarat, India</li></ul>	(GPA: 8.11/10)

## WORK EXPERIENCE

<b>SenSIP Lab, School of ECEE, Arizona State University</b>	<b>Tempe, AZ, USA</b>
Graduate Research Associate	Sep 2021 - Present
<ul style="list-style-type: none"><li>Developed a compact embedded ML algorithm utilizing <b>Pruning</b>, <b>Quantization-Aware Training</b>, and <b>8-bit Post-Training Quantization</b> for efficient and accurate topology classification in solar energy systems.</li><li>Conducted experimental <b>topology reconfiguration</b> research on a 3*3 solar array to <b>optimize power output</b> in solar panels under varying shading conditions, employing both simulation modelling (via <b>Simulink</b>) and practical experiments.</li><li>Deployed an optimized Embedded ML algorithm on an Arduino Nano BLE 33 using <b>TensorFlow</b> and <b>TensorFlow Lite Micro</b> Libraries, achieving real-time fault detection with 85.97% test accuracy. Leveraged Edge Computing for rapid identification and response to solar system anomalies.</li><li>Designed a <b>Monitoring Device Hardware</b> using various <b>sensors and microcontrollers</b> to measure important PV parameters such as Voltage, Current, Temperature, and Irradiance with a better transmission rate (1 second), and high accuracy (above 95%).</li></ul>	
<b>Tempe Campus, School of ECEE, Arizona State University</b>	<b>Tempe, AZ, USA</b>
Graduate Teaching Associate	Jan 2023 – Present
<ul style="list-style-type: none"><li>Providing support to students in understanding the concepts of <b>Fast Fourier Transform, Filters, Sampling, and related topics</b>.</li><li>Conducting 2-3 interactive live sessions every semester and providing problem-solving support to students, facilitating a practical understanding of the DSP concepts and their real-life applications.</li></ul>	
<b>SenSIP Lab, School of ECEE, Arizona State University</b>	<b>Tempe, AZ, USA</b>
Graduate Research Mentor	May 2024 – July 2024
<ul style="list-style-type: none"><li>Participated in an NSF-funded program to mentor undergraduate students from diverse backgrounds across the U.S. in foundational machine learning concepts and applications.</li><li>Guided students in developing a machine learning model for photovoltaic (PV) system monitoring, enhancing their understanding of renewable energy applications and practical ML deployment.</li></ul>	
<b>Skyworks Solution</b>	<b>Austin, TX, USA</b>
Broadcast Application Engineering Intern	May 2023 – Aug 2023
<ul style="list-style-type: none"><li>Engineered an advanced USB to SPI bridge (REV 2.0) using <b>ORCAD</b>, incorporating 4 chip select and reset lines. Optimized <b>MISO</b>, <b>MOSI</b>, and <b>SCK</b> pins, ensuring seamless replacement for Rev 1.0 with improved functionality.</li><li>Built driver code in <b>C++</b> enabling efficient <b>USB-SPI communication</b>, facilitating smooth data transfer with maintained compatibility and enhanced performance compared to REV 1.0.</li></ul>	
<b>Indian Space Research Organization (SAC-ISRO) - <a href="#">Link</a></b>	<b>Ahmedabad, GJ, India</b>
Student Research Intern (Co-Op)	Jan 2021 – Jun 2021
<ul style="list-style-type: none"><li>Led a team and refined an algorithm via <b>Covariance</b>, <b>Eigen Analysis</b>, and <b>Walsh-Hadamard Transform</b> to identify the Initial Sequence, Scrambling Polynomial (Up to 15 degrees), and Initial Seed from the scrambled transmitted data within 1-2 minutes.</li><li>Blindly identified the value of carrier frequency, bandwidth, and the modulation scheme of a signal in 0 dB or higher SNR value using <b>FFT</b>, <b>Down Sampling</b>, <b>Down Conversion</b>, and <b>Convolution</b>, and gained an <b>Accuracy of 95%</b> in carrier frequency and bandwidth identification.</li></ul>	

## ACADEMIC PROJECTS

### DeepBot: AI Portfolio Assistant

June 2025 – July 2025

- Developed and integrated a conversational AI assistant using the **OpenAI Assistants API (GPT-4o)** to provide real-time answers about my skills and experience.
- Engineered a **secure CI/CD pipeline** with GitHub Actions to automate deployment, ensuring API keys were never exposed in the public repository.
- Enabled **Retrieval-Augmented Generation (RAG)** by providing the model with a knowledge base of my resume and project data for accurate, context-aware responses.

### EdgeVoice: Real-Time Wake Word Detection on Embedded Systems

July 2024 – Sep 2024

- Collected and curated a **custom speech dataset** using recorded audio samples and publicly available data, preprocessing it with **Audacity** for noise reduction and normalization.
- Engineered a **Convolutional Neural Network (CNN)** architecture optimized for low-power devices, utilizing **MFCC feature extraction** (13 coefficients, 256 FFT length) to recognize speech with **78.63% test accuracy**.
- Implemented the model on **Arduino Nano 33 BLE Sense** with **TensorFlow Lite for Microcontrollers**, enabling **efficient real-time voice command processing** for edge AI applications.

## PUBLICATIONS

1. J. Larson, **D. Pujara**, D. Ramirez, L. Miller, T. Patel, N. Babar, A. Spanias, "WIP: Building a Research Experience for Undergraduates in Quantum Machine Learning" *2024 Frontiers in Education (FIE)*, Washington DC, USA.
2. D. Ramirez, **D. Pujara**, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Infrared Computer Vision for Utility-Scale Photovoltaic Array Inspection," *2024 15th International Conference on Information, Intelligence, Systems & Applications (IISA)*, Volos, Greece, 2024. *(Paper recently presented at the conference)*
3. **D. Pujara**, D. Ramirez, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Real-time PV Fault Detection using Embedded Machine Learning," *2024 IEEE 7th International Conference on Industrial Cyber-Physical Systems (ICPS)*, St. Louis, MO, USA, 2024, pp. 1-5.
4. W. Chao, A. Sharma, G. Uehara, L. Miller, **D. Pujara**, W. Barnard, J. Larson, and A. Spanias. "Introducing Quantum Computing in a Sophomore Signals and Systems Course." *2023 IEEE Frontiers in Education Conference (FIE)*, pp. 1-5. IEEE, 2023.
5. **D. Pujara**, D. Ramirez, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Design of a New Photovoltaic Intelligent Monitoring and Control Device," *2023 14th International Conference on Information, Intelligence, Systems & Applications (IISA)*, Volos, Greece, 2023, pp. 1-4.
6. S. Rao, **D. Pujara**, A. Spanias, C. Tepedelenlioglu and D. Srinivasan, "Real-time Solar Array Data Acquisition and Fault Detection using Neural Networks," *2023 IEEE 6th International Conference on Industrial Cyber-Physical Systems (ICPS)*, Wuhan, China, 2023, pp. 1-5.
7. **D. Pujara**, P. Patel and S. Gajjar, "Geo Tracking of Waste, Triggering Alerts and Mapping Areas with High Waste Index," *2020 IEEE 17th India Council International Conference (INDICON)*, New Delhi, India, 2020, pp. 1-5.
8. **D. Pujara**, P. Kukreja and S. Gajjar, "Design and Development of E-Sense: IoT based Environment Monitoring System," *2020 IEEE Students Conference on Engineering & Systems (SCES)*, Prayagraj, India, 2020, pp. 1-5.

## INVITED PRESENTATIONS

- **D. Pujara**, D. Ramirez, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Real-time PV Fault Detection using Embedded Machine Learning," *2024 SenSIP Industry Consortium*, Arizona State University, Arizona, USA, 2024.
- **D. Pujara**, D. Ramirez, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Design of a New Photovoltaic Intelligent Monitoring and Control Device," *2023-2024 Arizona Student Energy Conference*, Arizona, USA, 2023.
- **D. Pujara**, C. Tepedelenlioglu, D. Srinivasan and A. Spanias, "Design and Implementation of a Photovoltaic Monitoring Device," *2022-2023 SenSIP Industry Consortium*, Arizona State University, Arizona, USA, 2022-2023.

## SKILLS AND EXPERTISE

- **Programming:** Python, MATLAB, C++
- **Packages:** Scikit-Learn, TensorFlow, TensorFlow Lite, PyTorch, NumPy, Matplotlib, Pandas
- **Software:** Microsoft Office, Visual Studio Code, Arduino IDE, Raspberry Pie, LaTeX, Jira, Confluence, Simulink, Git
- **Sensors Used:** Arduino UNO, Arduino BLE 33 Sense, ESP 32 (Wi-Fi), XBee S2C, MCP2210 (USB to SPI Bridge)
- **Relevant Coursework:** Digital Signal Processing, Communication System, Machine Learning, Embedded ML (Edge Computing), Deep Learning, Speech Processing, Artificial Neural Computation, Python Programming, Random Signal Theory, Microcontrollers, and Microprocessors