

CALVIN A. PERUMALLA, PH.D.

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PROFESSIONAL SUMMARY

Signal processing engineer and data scientist (PhD, Electrical Engineering) with 8+ years building ML/DSP pipelines for multimodal biosignals and video. Expert in Python, PyTorch/TensorFlow, FIR/IIR filtering, FFT, and feature extraction; delivered state-of-the-art surgical activity recognition and ECG/EEG analytics.

Collaborative R&D contributor bridging sensors, algorithms, and deployment to produce reliable, clinically relevant insights.

SKILLS

- Signal processing (FIR/IIR filtering, FFT, feature extraction)
- Adaptive filtering (MMSE), time-series modeling
- Video-based activity recognition (CNN+LSTM)
- Python
- NumPy
- SciPy
- Pandas
- scikit-learn
- PyTorch
- TensorFlow
- Matplotlib
- Jupyter Notebooks
- SQL
- PySpark
- C++
- AWS
- Linux

RELEVANT WORK EXPERIENCE

Postdoctoral Researcher — Stanford School of Medicine (Feb 2021–Present)

- Designed signal processing pipelines converting video, EEG, and sensor streams into performance metrics.
- Built CNN-LSTM models for surgical activity recognition; achieved state-of-the-art gesture detection accuracy.

- Led development of conformable pressure-sensing systems; integrated acquisition and calibration for ultrasound/scoliosis studies.
- Co-PI for sensor-based OR assessment platform; informed productization and secured \$350K seed funding.

Data Scientist — Vectra (San Jose, CA) (Oct 2017–Mar 2020)

- Built production PySpark/SQL pipelines on billion-row datasets; engineered SparkML models for anomaly detection.
- Reduced analyst workload 80% via models detecting DNS exfiltration and DCE-RPC threats.
- Designed end-to-end ML architecture; delivered reliable, scalable algorithms in HPC environments.
- Collaborated cross-functionally, performing rigorous testing, validation, and peer reviews.

PhD Research Assistant — iWin Lab, University of South Florida (Jan 2013–Aug 2017)

- Developed ML and DSP algorithms for ECG diagnostics and PAF prediction using 24-hour recordings (~20GB).
- Achieved >99% PAF prediction and 98% arrhythmia classification with novel features and neural networks.
- Created MMSE-based iVCG signal conversion; reduced error to <6% and self-tracking error to <5%.
- Authored patents and publications on adaptive signal processing for wireless cardiac monitoring.

EDUCATION

- PhD, Electrical Engineering, University of South Florida, 2017 — Dissertation on ML and adaptive signal processing for ECG.
- MS, Electrical Engineering, University of South Florida, 2014.
- B.Tech, Electronics and Communication, Malla Reddy Engineering College (JNTU), 2011.

SELECTED ACHIEVEMENTS

- Two US patents granted in cardiac monitoring and atrial fibrillation prediction.
- 14 peer-reviewed publications; 2021 Holman finalist podium presentation.
- \$350K seed funding secured as Co-PI, Stanford Catalyst Program.
- Member, National Academy of Inventors (USF Chapter).