CALVIN A. PERUMALLA, PH.D.

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PROFESSIONAL SUMMARY

Signal processing engineer and data scientist with a PhD in Electrical Engineering. 8+ years building Python-based pipelines for biomedical time-series and video, including surgical activity recognition and wearable sensing. Deep expertise in filtering, spectral analysis, feature extraction, and deep learning; production ML experience with SQL/Spark. Collaborative communicator partnering with clinicians and engineers; proficient in C++.

SKILLS

- Programming Languages: Python, C++, SQL, MATLAB
- Frameworks & Libraries: PyTorch, TensorFlow, scikit-learn, NumPy, SciPy, Pandas, Matplotlib
- Tools & Platforms: Jupyter Notebooks, Databricks, Apache Spark, AWS, Linux, Windows, macOS
- Other Relevant Skills: FIR/IIR filtering, Spectral analysis (FFT), Wavelet analysis, Feature extraction, Time-series modeling, Activity recognition, Anomaly detection

RELEVANT WORK EXPERIENCE

- **Postdoctoral Researcher, Department of Surgery, Stanford School of Medicine — Stanford, CA (Feb 2021– Present)**
  - Analyzed multimodal surgical data streams (video, EEG, pressure, ultrasound) to extract objective performance and physiological metrics.
  - Built Python pipelines; trained CNN and LSTM models for surgical activity recognition with state-of-the-art detection accuracy.
  - Designed wearable sensing systems; led team; collected 200+ cases; validated algorithms with clinicians under IRB-approved protocols.
- **PhD Research Assistant, iWin Lab, University of South Florida — Tampa, FL (Jan 2013–Aug 2017)**
  - Developed ML and signal processing for ECG diagnosis and prediction using long-duration recordings and handcrafted temporal features.
  - Achieved over 99% PAF prediction and 98% classification accuracy with neural networks and novel feature engineering.
  - Implemented MMSE-based vectorcardiogram transformations; reduced error below six percent, improving wireless monitor accuracy.
- **Data Scientist, Vectra AI — San Jose, CA (Oct 2017–Mar 2020)**
  - Wrote high-performance SQL and PySpark to curate billion-plus rows; built scalable SparkML pipelines.
  - Designed production architecture; implemented and deployed ML models in high-performance computing environments.
  - Built anomaly detection for DNS and DCE-RPC threats; reduced analyst workload by eighty percent.

EDUCATION

- PhD, Electrical Engineering, University of South Florida, 2017; Dissertation: Machine learning and adaptive ECG signal processing.
- MS, Electrical Engineering, University of South Florida, 2014.
- B.Tech, Electronics and Communication, Malla Reddy Engineering College (JNTU), 2011.

SELECTED ACHIEVEMENTS

- Achieved over 99% PAF prediction accuracy on 24-hour ECG using novel features and neural networks.
- Reduced security analyst workload by 80% through deployed anomaly detection for DNS and DCE-RPC threats.
- Co-PI on Stanford Catalyst project; secured $350K seed funding for sensor-based surgical performance assessment system.
- Two US patents granted in cardiac monitoring and atrial fibrillation prediction.