CALVIN A. PERUMALLA, PH.D.

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PROFESSIONAL SUMMARY

Engineering PhD with 4+ years over all experience in applying **machine learning** (ML) in various domains including **healthcare** and **cybersecurity**. Data scientist with 2+ years with experience in **python**, **SQL**, **Spark**. Built, validated state-of-the-art **ML** models using **supervised** and **unsupervised** methods and **developed software** to run at **production** level. Innovative thinker with **patented** ideas, passionate about applying statistical and machine learning tools to deliver solutions.

SKILLS

- Core Tools: Python, PySpark, SQL, MATLAB, Databricks, Jupyter notebook
- Python packages: pandas, numpy, scikit-learn, scipy, matplotlib, networkx.
- Machine learning: Hypothesis Testing, Anomaly Detection, Logistic Regression, NNs, SVMs, OLS optimization, PCA, t-SNE, HDBSCAN, k-means, model performance, A/B testing, collaborative filtering.
- Other tools: Gephi, bash, Weka, AWS

RELEVANT WORK EXPERIENCE

Data Scientist, *Vectra AI (Visionary by Gartner), San Jose, CA*   Oct 2017 – Mar 2020

- Achieved **huge workload reduction** for **security analysts** by building a novel **anomaly detector** to identify **data exfiltration** over **DNS traffic** based on volume and URL entropy.
- Facilitated **advance monitoring** of **high value assets** in a customer network targeted by the **advanced attacker** by building a model that identifies them based on **user-service interactions**. Communicated method and results company-wide as this was a new direction.
- Provided **previously unavailable detection capability** for multiple DCE-RPC related threat models by building a **high precision** collaborative filter based anomaly detector based on baseline RPC behavior.
- **Individually** designed **software architecture** and wrote **production code**, implementing said models on high performance computing environment.
- **Skilled in ETL**: Wrote high performing SQL and PySpark to curate >1B (~TB) row data sets; Built SparkML pipelines.

Ph.D. Research Assistant, *iWin Lab, Electrical Eng. Dept., USF, Tampa, FL*   May 2013 – May 2014

- ML approach to diagnose **cardiac conditions (AF)** using **neural networks** with 98% accuracy.
- Designed **neural networks** and **SVMs** to predict **cardiac conditions** (PAF) with ECG recordings with high accuracy (> 99%)
- Worked an invention - integrated vector cardiogram (*i*VCG), a compact, remote, 24x7, diagnostic-quality cardiac monitor
- Showed latency reduction in **5G mobile networks** by predicting future base station connections.
- Used **LSTM**s to **predict** on time series data of mobile users in traffic.
- Achieved **95% accuracy** in predicting future base station connections for mobile user.

Ph.D. Teaching Assistant, *iWin Lab*, Electrical Eng. Dept., USF, Tampa, FL   Aug 2014 – May 2016

- Taught course material, graded exams, and held office hours.

EDUCATION

Ph.D., *Electrical Engineering (EE), University of South Florida, Tampa, FL*   Aug 2017
(*'**Machine learning** and adaptive signal processing techniques for electrocardiographic applications'*)

PATENTS

- R. Gitlin, G. Arrobo, T. Ketterl, P. Fabri, and **C. Perumalla**, "Integrated Vectorcardiogram System and Method of Use." US Patent No. 9,451,890, January 2016
- G. Arrobo, **C. Perumalla**, S. Hanke, T. Ketterl, P. Fabri, and R. Gitlin, "Systems and Methods for Managing Cardiac Rhythm." *(Utility patent filed)*

SELECTED ACHIEVEMENTS

- Published 7 articles to IEEE conferences
- Selected Member, National Academy of Inventors, USF Chapter