Fiona Victoria Stanley Jothiraj

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Education	**Oregon State University**	September 2023

Incoming – Doctor of Philosophy (PhD) in Artificial Intelligence
Area of Research: Security and Privacy in AI/ML systems, Responsible AI
Scholarship: Outstanding Scholars Program

University of Washington Bothell, Washington   September 2021 – June 2023
Master of Science in Computer Science and Software Engineering
Coursework: Deep Learning and Artificial Intelligence, Machine Learning, Internet of Things,
High Performance Computing, Research Methods, AI for Social Good, and Software Architecture
GPA: 3.92/4

PSG College of Technology, India   July 2015 – May 2019
Bachelor of Engineering in Robotics and Automation Engineering
Coursework: Machine Learning for Robotics, Artificial Intelligence for Robotics
GPA: 9.58/10

Skills

Languages: Python, C, C++, CUDA, MATLAB, SQL
A.I Tools: TensorFlow, PyTorch, Keras, HuggingFace, Caffe, Scikit-learn, OpenCV, Kats, Pandas, NumPy, PySpark, Matplotlib, SciPy, Weights & Biases
Other Tools: AWS (IoT Core, Sagemaker, Lambda, Kinesis, Glue, S3, SNS), Azure (IoT Hub, Stream Analytics, Function App), LaTeX, Git

Academic & Research	**ML/DL**	**Leadership**	**Other skills**
Open-source contribution	Quantization of Neural Networks	Mentorship	Technical writing
In-depth literature review	Multimodal Neural Networks	Project management	Application development
	Federated Learning		Pointillism Art
	Generative Diffusion Models		Piano – Grade 6

Publications

Personalized Emotion Detection using IoT and Machine Learning   ArXiv, 2022 [[Pre-Print](#)]
Fiona Victoria Stanley Jothiraj and Afra Mashhadi

Time Series Prediction for Food sustainability   ArXiv, 2022 [[Pre-Print](#)]
Fiona Victoria Stanley Jothiraj

Empirical Dynamic Modelling of the Multi-Source Park Visitation Data   Data for Policy, 2022
Vahid Shamsaddini, **Fiona Victoria Stanley Jothiraj**, Mandy Chen, and Afra Mashhadi [Conference Paper]

In-Progress Publications

Uncovering Nostalgic Conversations in Social Media Posts   [Under Initial Review]

Phoenix: Federated Learning for Generative Diffusion Model

Research Experience

Master's Thesis   September 2022 - June 2023
Phoenix: Federated learning for Generative Diffusion Model
- Novel method for training a Denoising Diffusion Probabilistic Model (DDPM) across multiple data sources, using federated learning techniques
- Phoenix is an unconditional diffusion model that leverages two strategies to improve the data diversity of generated samples even when trained on data with statistical heterogeneity (Non-IID data)

Computation Behavioral Modeling (CBM) Research Lab   June 2022 – Jan 2023
Lead Researcher (Graduate Research Assistant)

- Inspired by societal communication and behavior in social media, defined the research around the area of studying nostalgia or reminiscent behavior on social media
- Built traditional Natural Language Processing (NLP) models for classifying nostalgic conversations on the Twitter platform
- Applied NLP feature strategies: Bag of Words (BoW), Parts of Speech (POS), Term Frequency-Inverse Document Frequency (TF-IDF) and Word Embeddings
- Implemented transformer models: RoBERTa, DistilBert, ensemble models and ensemble-feature models to improve detection accuracy
- Mentored two undergraduate students to prepare exhaustive amounts of Twitter data
- Co-authored the empirical research paper on "*Uncovering Nostalgic Conversations in Social Media Posts*"

| Industry Experience | **Multicoreware Inc, India** | June 2019 – March 2020 |

Multicoreware Inc, India   June 2019 – March 2020
Machine Learning Engineer

- Designed and developed an EV Quantization logic in TensorFlow GPU for quantization aware training and Tensorflow Lite inference of Deep Neural Networks
- Deployed the open-source product to production. The project is used for Synopsys Design Ware EV (Electric Vehicle) Processors
- Development using C++, Python, Intel Intrinsics and Git
- Mentored peers on the quantization concepts and workflow of EV TensorFlow

Multicoreware Inc, India   December 2018 – May 2019
Machine Learning Intern
Skin Cancer Detection

- Developed a custom Convolutional Neural Network (CNN) model to detect moles for potential skin cancer by training with gigabytes of clinical image data

Audio Video LipSync

- Implemented the Audio Video LipSync™ API in Intels' OpenVino through a high-level C++ inference engine for 5x speedup
- Deployed the quality control tool for Over-the-top (OTT) streaming service providers, using deep learning technology
- Setup the LipSync™ technology demo for the National Association of Broadcasters Show (NAB 2019)
- Enhanced the user experience with a GUI to create out-of-sync videos using PHP and Python

Grad Course Projects

Time Series Prediction for Food Sustainability   Fall 2021

- Formulated a Statistical Regression Model that forecasts the productivity of over two-hundred food and crops in every country
- Performed data preparation and analysis with tests such as Granger Causality and Augmented Dickey–Fuller (ADF) to test causality and stationarity of the time-series data
- Research work led to a pre-print publication on September 2022

Personalized Emotion Detection using IoT and Machine Learning   Fall 2021

- Worked on a research project to study how emotions could be detected in a person using physiological signals especially for individuals with Autism Spectrum Disorder (ASD)
- Designed a non-invasive emotion detection system using Machine learning modeling and Cloud Computing
- Research work led to a pre-print publication on September 2022

Accelerated Image Restoration using CUDA — Winter 2022

- Partnered with three graduate students and worked on project to accelerate the reconstruction of images using CUDA parallelization techniques
- Designed CUDA kernels from scratch for the following functions: Point-Spread Function, Wiener Filter, Discrete Fourier Transform, Inverse Discrete Fourier Transform and Calculate-PSNR (Peak Signal to Noise Ratio)
- Applied different strategies by varying Grid size, Block size and Image Dimension size to understand the change in performance speed
- Profiled the results using NVIDIA Nsight profiler and achieved a speedup of 10x when compared to the CPU OpenCV's implementation

Spatio-Temporal Forecast Modeling and Fairness of Traffic Fatality — Spring 2022

- Implemented forecasting and deep learning modeling techniques to estimate the hotspots for traffic fatality in the United States
- Analyzed the fairness of prediction in different counties of the United States based on the Social Vulnerability Index (SVI)
- Analyzed explainable AI system using SHapley Additive explanation (SHAP)
- Experimented with machine learning models such as Random Forest Classifier, Convolutional LSTM Network, and Prophet Forecasting model
- Handled Gigabytes of geospatial and multimedia data

Awards & Achievements

2023 Awarded scholarship at Oregon State University as part of the **Outstanding Scholars Program**
2022 Virtual scholarship to the **Grace Hopper Women in Computing Celebration**
2021 Amazon Web Services **(AWS)** Machine Learning Specialty - Certified
2019 **Academic Excellence** (Ranked 1/80) issued by the Robotics and Automation Engineering Association
2019 Awarded '**Monarch of the Month**' in August for individual contribution to TensorFlow quantization at Multicoreware Inc

Leadership

2018 Developed a website for the International Conference on Automation Robotics and Sensing (**ICAARS**)
2017 **Graphic Designer** for the College Magazine 'The Bridge'
2016 Coordinated the **IEEE SRiSHTi'16** Technical symposium held at PSG College of Technology