Naga Sai Pranay Modukuru

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Fachhochschule Südwestfalen

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Master of Science in Systems Engineering and Engineering Management

Apr. 2018 - Present Soest, NRW, Germany

• Focus areas: Machine Learning and Artificial Intelligence, Signal Processing, Microprocessor-Based Systems, Business in Engineering

Bachelor of Technology in Electrical and Electronics Engineering

Sep. 2013 - Apr.2017

Hyderabad, India

Jawaharlal Nehru Technological University

o **Focus areas**: Microcontrollers and Microprocessors, Neural Networks and Fuzzy Logic, Control Systems, Power Electronics, Analog Electronics

EXPERIENCE

Master Thesis

Dec. 2019 - May. 2020

Soest, NRW, Germany

Fachhochschule Südwestfalen

- Title: "Enabling Lifelong Learning in Neural Networks with Gradient Monitoring and Dynamic Architectures"
- o Devising an algorithm to train Multi-headed ANNs on fault classification, image recognition
- Working on developing algorithms for Predictive Maintenance and Automation using Machine Learning Tools: Python, PyTorch

Research Assistant - Automation Technology

Aug. 2019 - present

Fachhochschule Südwestfalen

Soest, NRW, Germany

• Research:

- * Implemented a novel Nonlinear-Convolutional layer using PyTorch
- * Evaluating performance of layer on fault classification and image recognition tasks

Tools: Python, PyTorch

- o Data Analysis:
 - * Analysing raw industrial data to depict relations between different stages of production processes
 - * Visualizing various features to understand effects of one process on another
 - * Developed a framework to automate feature extraction from large amounts of data

Tools: Python, Pandas, Numpy, Matplotlib, Seaborn, Plotly

Teaching Assistant - Control Systems and Neural Networks

Feb. 2019 - Jul. 2019

Fachhochschule Südwestfalen

Soest, NRW, Germany

- Preparation of course content for modules 'Control Engineering' and 'Machine Learning'
- Conducted 'Control Engineering' Lab sessions for undergraduate students Tools: Python, Keras, MATLAB, Simulink

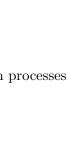
Application Developer (Freelance)

Sep. 2019 - Dec. 2019

Continuum (Worked as part of start-up project)

Zambia, Africa

- Developed a Deep learning Application for an insurance firm to predict future costs for the firm and probable diseases for the customer
- Performed Data Analysis to determine important features for making predictions
- Developed web-based desktop application to deploy the model Tools: *Python, Keras, Flask, Tkinter*



SKILLS

- Industry Knowledge: Deep Learning, Machine Learning, Computer Vision, Signal Processing, Image Processing, Microcontrollers
- Programming Languages: Python, C/C++, MATLAB, SQL, HTML, CSS
- Tools and Technologies: Git, Github, Docker, LabVIEW, Arduino, Raspberry Pi, AVR Studio, PSpice
- Operating Systems: Windows, Linux (Ubuntu)
- Languages: English, German, Hindi, Telugu
- Python Libraries and Frameworks: PyTorch, TensorFlow, Keras, PySpark, Scikit-Learn, SciPy, XGBoost, OpenCV, Numpy, Pandas, Matplotlib, Seaborn, Plotly, Flask, SQLAlchemy, Tkinter

Projects

- PMSM Rotor Temperature Prediction: Trained a Convolutional Neural Network (CNN) on Time-Series sensor data of a Permanent Magnet Synchronous Motor (PMSM). Achieved an R2 Score of 0.98 in predicting the rotor temperature under different operating conditions. Tools: Python, PyTorch
- Soft Sensor Development: Used Machine Learning to predict process variables in Tenesse Eastmann Process, which are usually measured with sensors. Trained Support Vector Machines, Decision Trees and Deep Neural Networks to predict the component measurements. Tools: Python, Scikit-Learn, Keras
- Denoising Autoencoder: Removed coffee stains, folds, footprints and wrinkles from scanned documents using a Convolutional Neural Network (CNN)-based Autoencoder. Trained a CNN-Autoencoder on Noise Office Dataset. Tools: Python, PyTorch, OpenCV
- Hand Gesture Detection: Trained a Convolutional Neural Network (CNN) on hand gestures and achieved a test accuracy of 100 percent. Collected hand gestures using OpenCV from a laptop's webcam. Tools: Python, PyTorch, OpenCV
- Morse Code Decoder: Designed a Digital Filter to remove noise from a modulated signal and implemented an algorithm to decode the filtered signal. Tools: *C, MATLAB, LabVIEW*
- Microcontroller-based Temperature Controller: Used an AVR ATMega128 Microcontroller to control the temperature of an oven. Designed an algorithm in C to control the nonlinear behavior of the temperature. Tools: C, AVR Studio, AVR ATMega128, LabVIEW

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