

# Monica R. Tirupari

Brooklyn, NY | (405) 630-5898 | Email: [monicareddy@gmail.com](mailto:monicareddy@gmail.com) | LinkedIn: [linkedin.com/in/monicareddy/](https://www.linkedin.com/in/monicareddy/) |  
GitHub: <https://github.com/Monica2793>

## PROFILE

- Master's Graduate from New York University's Tandon School of Engineering. Strong emphasis and application of **Machine Learning, Data Center & Cloud Computing**, Programming for **Big Data Analytics** and **Deep Learning**.
- **Cisco Certified Network Associate** – ID No. CSC013043373 (961/1000)
- **Amazon Web Services Certified Solutions Architect Associate** (Expected February 2018)

## EDUCATION

**New York University**, New York City, NY (GPA 3.38/4) **Aug 2016 – May 2018 (Expected)**  
Master of Science, Computer Engineering

**Visvesvaraya National Institute of Technology**, Nagpur, India (GPA 7.01/10) **Aug 2012 - May 2016**  
Bachelor of Electronics and Communications Engineering

## SKILLS

**Programming Languages:** C, Python, Java, R, HTML, JavaScript

**Software Tools:** Microsoft Word, PowerPoint, Excel, Adobe Photoshop, MATLAB, Xilinx, GNS, Tableau, NGSPICE, VHDL, Eagle PCB design, MySQL, Wireshark, Metasploit, Nessus, Hadoop, MapReduce, Pig, Hive, Apache Spark, NoSQL, Flume, Iptables

**AWS Tools:** S3, EC2, EBS, Route 53, IAM, VPC, RDS, Redshift, Lambda, DynamoDB

**Operating Systems:** Linux, Windows, Mac OSX

## WORK EXPERIENCE

**Graduate Analyst | Bio-Engineering Department | New York University** **Jan 2017 – Present**

Maintained the software systems to track and coordinate of all professors' time. Prepared time allocations of each professor spent for the lectures, laboratories, project work, recitations and research for four semesters. Extracted the required data using pivot tables and given presentations to the department for the budgeting and pay allocation.

**Alternative Media Assistant | Moses Center | New York University** **Nov 2016 – Dec 2016**

- Experience on AWS cloud services like EC2, S3, RDS, ELB, and EBS for installing, configuring and troubleshooting on various Amazon images for server migration from physical into cloud.
- Helped in converting documents into braille using Visual Studio, Adobe Illustrator, Adobe Acrobat, Omni Page and Capture Perfect. Data entry and data cleaning in clock work and excel.

## PROJECTS / CERTIFICATIONS/ LABS

**Adversarial Machine Learning: The Attacks and the Defenses**

- MNIST dataset with 70,000 handwritten samples is used to learn the adversarial examples using training and testing samples.
- Built a neural network using a Theano library for Red team (attackers) and Blue team (Defenders).
- We have used ReLU activation function and RMSprop for adaptive learning and plotted the accuracy and confidence.
- Then we have performed the L1 and L2 regularizations on the adversarial images and improved accuracy and confidence.
- We have created this learning model using Python modules like theano, numpy, pickle and plotted graphs using matplotlib.

**Music Classification using a Neural Network**

- Loaded the music data files from University of Iowa, harmonics of audio notes with respect to fundamental frequency is achieved using melspectrogram and specshow of librosa package.
- Built a Neural network classifier using sigmoid activation and printed the model summary. Saved the loss and validation accuracy defined using a callback class.
- Created an optimizer and compiled the model using compile method. Fitted the model for few epochs and passed the test data using the callback class.
- I have achieved validation accuracy which is above 99%, plotted the loss values using semilogy plot.
- Optimized entire program using three different learning rates with plotting the loss functions and found lower learning rates are more stable hence converge slower.

**Neural Data Model Order Selection for CRCNS DREAM dataset**

- I have used DREAM dataset of Neuroscience website CRCNS. Used loadmat function from scipy.
- Using Heuristic model selection, I have formulated models of different complexities and linear fitted on all the neurons using fit and predict functions in regression.
- Sorted top 100 neurons having highest R-Squared values using argsort function and discarded neurons which have lower correlations.
- Used K-fold cross validation to find Optimal order of Neurons visualizing through errorbar plots.

**Extended MNIST letter detection using SVM**

- I have added non-digit letter images to MNIST digit data, remapped then between -1 to 1 and plotted using imshow method.
- Performed exception and error handling in python, included the non-digits using skimage package.
- Defined and tested the MNIST reshape program using python and plotted the resized images using subplot function.
- Dumped the resultant captured images using dump method in pickle and created extended training data using vstack command in numpy.
- Created and ran a SVM classifier and fitted training samples randomly using fit command in SVM, therefore achieving above 96% accuracy.
- I have normalized the confusion matrix and did some error plots.

### **Breast Cancer Diagnosis through Logistic Regression**

- Loaded Wisconsin breast cancer database using pandas read\_csv function. Cleaned the data using dropna method.
- Coded up the classifier function and measured the Precision, Recall, F1-Measure and then accuracy of the classifier.
- Fitted the data using logistic module through sklearn package.
- Used n-fold cross validation and measured the accuracy on training data and testing data.
- Implemented ROC curve for the classified data using sklearn module.

### **Gradient Descent Optimization**

- Computed Gradient descent and Loss functions using class methods and Lambda functions. Tested the gradient descent by measuring the actual and predicted functional difference.
- Built a simple gradient descent optimizer function with a fixed learning rate and with random initial condition. Measured the accuracy of final estimate.
- Used different learning rates for better convergence and accuracy. Plotted number of iterations and true function for different learning rates.
- Made a new Gradient optimizer using adaptive step size with the help of Armijo rule and got results with more better accuracy.

### **Trend Analysis of USSEC Stock data**

- Trade to Order Volume ratio of each exchange over millions of trades and trade volume are analyzed for each quarter of a year using Apache Spark, Python, R and Tableau.
- Predicted the next trade volume for top 6 companies with different exchanges using ARIMA time series model for five-year data and predicted the future data using R.
- Made an interactive dashboard with Python Plotly and Tableau enabling user interface with selective widgets and options.

### **Analyzing Yelp Data Set Challenge**

- Analyzed Yelp data set (in JSON format) using PIG Latin running on Hadoop and summarized the number of reviews of all the businesses in the data by each business category.
- Ranked all cities by businesses in the ascending order for each category of the data.
- Found rank summaries and average ratings for businesses running in a location range within USA.
- Completed the same assignment in Apache Spark and reviewed the difference in approaches.
- Provided statistical analysis and visualizations (distributions, graphs, maps) of the results in Tableau and Excel.

### **Text to Speech Reader for the Visually Impaired**

- Used LabView for the concepts of image analysis and Optical character recognition.
- Implemented on MYRIO which is an ARM Cortex A9 processor.

### **Primary Education through Digital Slate and Telecom**

- Designed and developed a very low cost digital slate-based application for delivering Primary Education under the Center of Excellence program of our college.
- Created a client-server application using Java socket programming on Android platform.

### **Cisco Certified Network Associate – ID No. CSC013043373 (961/1000)**

**Aug 2016**

- Configured Routing protocols (OSPF, BGP, VLANs, STP, HSRP) using command prompt and Linux platform, performed virtual simulation using GNS & Packet Tracer
- Learned multiple Switching functionalities
- Configured, verified and troubleshot IPv4 and IPv6 addressing of various network devices.
- Securing the network using ACL, Ex-ACL, DCL
- Experience working with real time Routers and Switches.

### **Flow Table Management and SDN Controller Programming**

- Created a network topology using Mininet and configured the controller to perform intelligent packet routing.
- Programed the RYU controller for flow table management, table size being the limiting factor.

### **Network Configuration and Ethical Exploration**

- Setup networks using cisco routers and worked on TCP, UDP, FTP, RIP, HTTP, DNS, DHCP, SSH, SNMP, NFS and other widely used protocols.
- Performed the SSL Strip MITM and DHCP Starvation attack. Exploited the victim to get shell access and transfer files.

### **Establish customized Network Topology using Mininet**

- Created python scripts to establish network topologies and customize the parameters such as Host IP and MAC addresses, link latency, link bandwidth and link packet loss rate
- Generated TCP flow between hosts using iperf and measured the bandwidth.

### **Network Packet tracing & vulnerability scanning**

- Vulnerability scan using Nessus gives the severity of the open ports
- Exploitation of a host through the open port using Metasploit.

### **SOCIAL ACTIVITIES (Visvesvaraya National Institute of Technology, Nagpur, India)**

**Founding Member of 'Prayaas'**. Administrator and Event Manager of a non-profit club founded in my college.

**2012 - 2016**