# Anveshrithaa Sundareswaran

Email: anveshrithaas@gmail.com
Personal Website | GitHub | Google Scholar | Medium
Mobile: +91 9500382149

## EDUCATION

July '17 – Present **Vellore Institute of Technology** **Vellore, India**
*Bachelor of Technology in Computer Science*
*CGPA: 9.21/10*
*Relevant coursework*: Data Structures and Algorithms, Object Oriented Programming, Database Management Systems, Software Engineering, Web Programming, Distributed Systems, Artificial Intelligence, Machine Learning, Natural Language Processing.

## RESEARCH INTEREST

Machine Learning | Deep learning, Neural networks | Computer Vision | Applied machine learning and deep learning for real-world problems, especially in medical imaging, weather analysis and intelligent transportation systems | Generative Adversarial Networks (GANs) and generative models | Big data and stream processing.

## TECHNICAL SKILLS

- ***Programming languages*** – *(Proficient)* Python, C, C++, Java, *(Basics)* R, MATLAB
- ***Machine learning/ Data science/ Big data tools and frameworks*** – Apache Spark (PySpark), Apache Kafka, TensorFlow, Keras, PyTorch, Scikit-learn, Matplotlib, Pandas, Numpy, NLTK
- ***Web development*** - HTML, CSS, JavaScript, Node.js, PHP, jQuery, ASP.NET
- ***Databases*** – MySQL, MongoDB
- ***Cloud*** – AWS (S3, EC2), Confluent cloud
- ***Version control*** – GIT
- ***Other tools*** – MS Excel, Latex, MS word, MS PowerPoint

## PUBLICATIONS

Journal Articles

**Real-Time Weather Analytics: An End to End Analytics Framework over Apache Spark with Kafka using Long Short-Term Memory Networks**
- Under the guidance of Dr. Lavanya K
- Submitted to International Journal of Cognitive Computing in Engineering – KeAi Publishing (2021 - Under review)

**Real-Time Vehicle Traffic Prediction in Apache Spark Using Ensemble Learning for Deep Neural Networks**
- Under the guidance of Dr. Lavanya K
- International Journal of Intelligent Information Technologies (IJIIT) -Special issue on Intelligent Data Analytics for Interdisciplinary domains, Vol 16, Issue 4. (2020)

**Promoter Prediction in DNA Sequences of Escherichia coli using Machine Learning Algorithms**
- Under the guidance of Dr. Jaisankar N
- Best Student Paper award at IEEE Student Paper Contest (IEEE MAS-SPC), 2019
- International Journal of Scientific & Technology Research (IJSTR), Vol.8, Issue 11 (2019)

Books/Monographs

**Unsupervised Learning Approaches to Dimensionality Reduction and Data Visualization** (in progress)
- Under the guidance of Dr. B. K. Tripathy
- Book proposal accepted by CRC press - Taylor & Francis group, USA (2021)

Conference papers

**Real-Time Vehicle Traffic Analysis using Long Short-Term Memory Networks in Apache Spark**
- Under the guidance of Dr. Lavanya K
- Presented at IEEE International Conference on Emerging Trends in Information Technology and Engineering, 2020
- Published in IEEE Xplore digital library (April 2020)

Online Technical Blogs

**Apache Spark series**
- Part 1 - Getting started with Apache Spark | Part 2 - Introduction to PySpark | Part 3 - Understanding Spark RDDs | Part 4 - Machine Learning in PySpark | Part 5 - End-to-end machine learning pipeline on databricks.
- Published in Analytics Vidhya

## INDUSTRIAL / RESEARCH/ ACADEMIC INTERNSHIPS

Sep '17 – Present **Deep learning research intern** **Taiwan**
*Integrated MechanoBio Systems Lab at National Cheng Kung University, Taiwan*

- Working under Dr. Ting-Yuan TU
- Working on applying deep learning for classification, segmentation and tracking of cell images from 3D cancer spheroids at matrix interface to aid in cancer drug discovery

June '20 – July '20 **Summer Student at Tsinghua Deep Learning School** **China**
*Tsinghua University, China*

- Worked on multiple mini projects, attended lectures on state-of-the-art deep learning concepts and re-implemented seminal papers in deep learning under research group of Prof. Jun Zhu, Prof. Xiaolin Hu and Prof. Minlie Huang
- Received the Outstanding Student Award – first rank in class
- Represented India – only student selected from India

May '20 – Sept '20 **Data Science intern** **Canada**
*50 Hands Organization, Ontario, Canada*

- Responsibilities include data planning, collection and cleaning, ETL and data analysis for providing crowd sourced solutions at scale using data driven models.
- Built an exclusive analytics website *NuviSights* that provides insightful visualizations of trends and patterns from analysis of crowd sourced data.

May '19 – June '19 **Web developer** **India**
*Vellore Online Systems (P) Ltd, Vellore, India*

- Developed a scalable and robust hospital information system for managing information within a hospital network using web technologies.

## AWARDS AND ACHIEVEMENTS

- **Outstanding Student Award at Deep Learning Summer School**
  *By Dept. of Computer Science and Technology at Tsinghua University*
- **Best Student Paper Award**
  *At IEEE Student Paper Contest 2019 by IEEE Madras Section*
- **Raman Research Award and Scholarship**
  *By Vellore Institute of Technology for research contribution during undergraduate studies*
- **Achiever Award**
  *By Vellore Institute of Technology for achievement in national level technical events*
- **Fast track Research Initiative Grant**
  *Monetary grant from Vellore Institute of Technology for a research project*
- **Selected for 2020 CCU Summer Research fellowship**
  *By National Chung Cheng University, Taiwan, for a 12-week summer research program*

## PROJECTS

Funded projects

**Real- time analytics of soil and weather conditions using Machine Learning, IoT and Big data for Agriculture**

- Implemented an end-to-end pipeline where data streams from sensors are streamed through Apache Kafka and analysed using machine learning algorithms in Apache Spark for real-time implementation in the farmland of VIT School of Agriculture.

Non-funded/ Course projects

**Traffic light mapping and recognition using CNN for Autonomous Vehicles**

- Implemented a framework using a two-stage deep learning based approach for detection and classification of traffic lights from images for the purpose of automated driving using TensorFlow Object Detection API and CNN.

**End-to-end machine learning pipeline in PySpark using Amazon S3 for marketing classification**

- The data stored in the S3 bucket is pulled to the Spark environment on databricks platform to build a machine learning pipeline in PySpark to perform classification for a bank marketing classification problem using Spark's machine learning library- MLlib.

**SHARS: An Online Medical consultation and Medicine Retail System**

- A complete web application for online medical consultation with doctors, ordering medicines from medical stores integrated with three machine learning modules - X-ray analysis for bone fracture detection, Optical Character Recognition for prescription reading and Chatbot using NLP.

**Information extraction from resumes using natural language processing**

- Built a resume parser to extract necessary information from resumes using NLP tools and techniques. The parser was built using Spacy - an advanced natural language processing library.

**Diabetes onset prediction using neural networks with grid search optimization**

- Implemented a deep neural network using Keras and Scikit-learn to predict the onset of diabetes on the pima Indians diabetes dataset. Grid Search technique was used for tuning the network's hyperparamaters for better model performance. Scikit-learn API was used with Keras model by using wrappers.

**Image restoration using Super Resolution Convolutional Neural Network**

- Implemented a Super Resolution Convolutional Neural Network (SRCNN) - a deep convolutional neural network that learns end-to-end mapping of low resolution to high resolution images, using Keras. The images were processed using OpenCV and converted between color spaces.

**Lung nodule detection from CT scan images using segmentation techniques**

- Developed a framework in MATLAB to detect nodules in lungs from chest CT scan images using segmentation and other image processing techniques.

**E-commerce platform using Node.js and MongoDB**

- Implemented an e-commerce website developed using web technologies and frameworks like Node.js, Passport.js, Express.js, HTML, CSS and JavaScript with MongoDB as backend.

## ONLINE COURSES AND CERTIFICATIONS

Online video lectures

- CS229: Machine Learning by Stanford University
- CS230: Deep Learning by Stanford University
- STAT 442/842: Data Visualization by University of Waterloo
- CS231n: Convolutional Neural Networks for Visual Recognition by Stanford University
- CS4780: Machine Learning for Intelligent Systems by Prof. Kilian Weinberger from Cornell University

Certifications

- Machine Learning by Stanford University
- Neural Networks and Deep Learning by deeplearning.ai
- Machine Learning with Python by IBM Cognitive class
- Machine Learning A-Z: Hands-On Python & R in Data Science from Udemy
- AWS Machine Learning from Udacity
- Machine learning by building projects from Eduonix
- Taming Big Data with Apache Spark and python –Hands on by Udemy
- Web Design for everybody Specialization (4 courses + 1 capstone) by University of Michigan
- Human-Centered Design by UC San Diego
- Fundamentals of Digital Image and Video Processing by Northwestern University
- Data Structures by UC San Diego
- Automata Theory (with distinction) by Stanford Online Lagunita

## TEACHING EXPERIENCE

- Teaching Assistantship at Undergraduate level
  - CSE4022 – Natural Language Processing under Prof. Sathyaraj (Winter 2019–20)
  - CSE1007 – Java Programming under Prof. Jaisankar N (Winter 2019–20)
  - CSE1004 – Network and Communication under Prof. Jaisankar N (Winter 2018–19)
- Prepared video lectures on basics of NLP for the ‘Essentials of Machine Learning’ course in VIT Online Learning (VITOL) platform (2020)

## WORKSHOPS AND SEMINARS

February 2020 **Talk on “Machine Learning in Apache Spark”** **Vellore, India**

- Delivered a talk to trainees recruited for the VIT-Virtusa Center of Excellence (CoE).

January 2020 **Seminar on “Java for Android”** **Vellore, India**

- Conducted a seminar for a class of 121 undergraduate students.

March 2019 **Workshop on Artificial Intelligence in Agriculture**. **Vellore, India**

- Participated in the workshop organized by Institution of Engineering and Technology (IET) and gave a presentation on "Introduction to Artificial Intelligence".

February 2019 **Devspace 2019 – A Developers Conference**. **Vellore, India**

- Participated in the biggest developers' conference at VIT organized by Computer Society of India (CSI) in association with more than 17 industry partners including IBM, Amazon, Mozilla, Digital Ocean.
- Guided hackathon teams in implementing ideas through a prototype and provided technical assistance during hands-on workshop on "Voice UI using Alexa" by Amazon.

January 2019 **Seminar on "Prevention of ARP Spoofing in WLAN"** **Vellore, India**

- Hosted a seminar for a class of 64 undergraduate students.

## VOLUNTEERING AND OUTREACH

2020 – present Member and Volunteer at AnitaB.org

2019 – present Mentoring female undergraduate students and peers who are interested in Computer Science and AI through self-formed student group and lean in circle.

2018 - 2019 Served under the National Service Scheme (NSS) for 2 years at Vellore Institute of Technology, Vellore.

January 2019 Organized a NSS Special camp at a rural village in Vellore to teach computer science and coding basics for high school girls and help in skill development along with fellow NSS volunteers at VIT.

February 2019 Participated in the Ecological festival of Western Ghats - a National Conference conducted by Save Western Ghats Movement (SWGM) at Coimbatore, India.

May 2019 Volunteered at the 7-day NSS Special camp at a rural village in Coimbatore, organized to create awareness on sanitary and menstrual hygiene, set up medical camp and conduct clinical blood tests.