Sandeep N Menon | Resume

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Research Interests

Deep Learning, Computer Vision, Human Computer Interaction

Education

- **National Institute of Technology Karnataka, Surathkal** — **Mangalore, Karnataka**
  B.Tech Computer Science and Engineering, CGPA: 8.83/10 — *2014–2018*
- **Kendriya Vidyalaya Rubber Board Kottayam** — **Kottayam, Kerala**
  High School, 2^{nd} in class, 97.00%, centum in Mathematics — *2012–2014*

Accepted Publications

- **A Novel Deep Learning Approach for the Removal of Speckle Noise from Optical Coherence Tomography Images using Gated Convolution Deconvolution Structure**
  Sandeep N Menon, V B Vineeth Reddy, Yeshwanth A, Anoop B N and Dr. Jeny Rajan
  Published in 3^{rd} International Conference on Computer Vision & Image Processing

Industrial Experience

- **Microsoft** — **Hyderabad, India**
  Software Engineer in Dynamics 365 Sales Insights — *June 2018 – Current*
  - Designed and implemented Dynamics 365 Sales Insights connector in Microsoft Flows. Handles more than 9M monthly requests.
  - Experience in developing and deploying scalable cloud resources in Azure.
  - Contributed to new Sales Insights admin experience developed in React Custom Controls, Redux and Office Fabric.
  - Experience in writing data migration jobs in *CosmosDB*.
- **Microsoft** — **Hyderabad, India**
  Software Engineering Intern in Dynamics CRM team — *May –July 2017*
  - Secured 1^{st} position in Microsoft Artificial Intelligence Meet 2017 for best short paper.
  - REST API development using *C#* and *.NET* Framework.
  - Contributed to *Microsoft Adaptive Cards* open source library.
- **CogniCor Technologies** — **InfoPark, Kochi, India**
  AI Engineering Intern — *December 2016*
  - Designed and implemented a Recommender System using Deep Wide Neural Networks.
  - Implemented a web scraper to extract heading trexts from webpages using CNNs written in *Tensorflow*.

Selected Projects

All projects available on **github**.

- **Removing Speckle Noise from Optical CoherenceTomography Images (OCT)**
  - Studied noise distribution in OCT images through statistical analysis.
  - Designed and implemented a gated convolutional auto-encoder-decoder model to remove noise from the images.
  - Used image quality metric SSIM and its derivatives as the loss function of the neural network, providing a superior visual quality.
  - Achieved 25.6 PSNR and 0.91 SSIM for de-noised images. Results superior to convenional methods.

- **Handedness classification based on Offline Handwriting**:
  - Researched on the characteristic differences between left and right handed writings.
  - Calculated average inclination and curvature of letters as features.
  - Implemented an ensemble model of *XGBoost* and *Multi-layer perceptron* to achieve an accuracy of 91.9%
- **Virtual gym trainer** *(Demo link)*
  - Designed and implemented a platform where users will be guided throught exercises like a personal trainer.
  - Real-time human pose estimation done using PoseNet network.
  - Implemented a state machine that uses the human pose to geometrically estimate the correctness of the posture to inform the users.
- **Intelligent security guard**
  - Used flood-fill algorithm to understand if gate is open or not.
  - Deployed CNN model on IOT device to count number of vehicles entering and exiting the gate.
- **Face Tracking Raspberry Pi Bot**:
  - Raspberry Pi and a camera module mounted on wheels that detects and tracks a given face.
  - Face detection using OpenCV. The relative position of the bot and the face is calculated by a tracking algorithm and required signals are sent to the wheels.
- **Scene Change Detection in a Video**:
  - Scene changes or cuts detected in a video using texture based methods.
  - Texture of a frame is calculated using local binary patterns and spatial co-relation features.

Selected Coursework

Undergraduate courses

- Design and Analysis of Algorithms
- Advanced Data Structures
- Introduction to Graph Theory
- Digital Image Processing
- Probability Theory
- Linear Algebra and Matrices

Online courses

- Convolutional Neural Networks by *deeplearning.ai*
- Introduction to Computer Vision, *Georgia Institute of Technology*
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by *deeplearning.ai*
- Introduction to Database Systems, *University of California, Berkeley*
- Neural Networks and Deep Learning by *deeplearning.ai*
- Structuring Machine Learning Projects by *deeplearning.ai*

Technical skills

- Proficient in C, C++, C#, Python, Octave, Matlab, Java, TypeScript, JavaScript, MySQL, TeX
- Experience in Tensorflow, Keras, PyTorch, SciPy, NumPy, OpenCV, .NET, React.
- Cloud computing experience in Azure and Amazon Web Services

Extra-curricular activities & Achievements

Leadership and Organizational Experience

- President at Web Enthusiasts' Club, NITK
- Core executive member at IEEE college student chapter

Achievements

- Secured 1^{st} position in Microsoft Intelligent Edge Hackathon 2019.
- Ranked 4^{th}(1000+ teams) in India for *IEEEXtreme 11.0 Programming Competition*
- Represented state for National Level Chess Tournaments
- Listed in top 0.1% in National Level Mathematics Board Exam