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SUMMARY

I have 12+ years of experience in Artificial Intelligence within Research, Educational and IT sector. Presently working as Lead Data Scientist at AccelTree Software Private Ltd., Pune. The responsibilities include identifying and integrating new datasets that can be leveraged through company product capabilities and work closely with engineering team to strategize and execute the development of product, implement analytical models into production by collaborating with s/w developers and machine learning engineers and finally communicate analytic solutions to stakeholders.

Currently pursuing Ph.D. in Artificial Intelligence from SPIT, Mumbai. Research interests include pattern recognition, machine learning and brain-computer interfaces. Published various research papers in the reputed international journals and conferences like IEEE, Springer, Inderscience etc.

EDUCATIONAL QUALIFICATION

- **Pursuing PhD- Computer Engineering-** Sardar Patel Institute of Technology, Mumbai.
- **Masters of Engineering-Computer Engineering-** Vishwakarma Institute of Technology, Pune, 70.03%, 2008.
- **Bachelor of Engineering – Information Technology -** Shivaji University, 68%, 2004.

CERTIFICATION

- **IBM Data Science Professional Certification**
- **Data Science A-Z™: Real-life Data Science Exercises**
- **A-Z Machine Learning Using Azure Machine Learning (AzureML)**

SPECIAL ACHIEVEMENTS

- **Qualified in GATE 2006-** All India Rank 809
- **Funded Research Project-** By BCUD,SPPU Pune.- [2016-2018]
- **Funded Research Project-** By GPU Centre of Excellence, IIT Bombay.
- **GIAN Course Exam Brain Computer Interface for Speech Communication: Theory and Applications**- Successfully Completed at IIT Guvahati,2018.

WORK EXPERIENCE

- **Lead Data Scientist** – AccelTree Software Private Ltd., Pune (May 2018 to till date)
- Research in AI/ML – (03 years)
- AI/ML Training – Assistant Professor, Sinhgad College of Engineering, Pune (9 years)

INDUSTRIAL PROJECTS (Machine Learning)

Major Libraries/platform Used: TensorFlow, Scikit-Learn, Numpy, Keras, Jupyter Notebook, SciPy, Theano, Pandas, Flask, Gunicorn, Nginx **,** OpenCV, cloud aws etc.

- **Document Classification Using Deep Learning:**
  Convolutional neural network (CNN) – a pillar algorithm of deep learning -- has been one of the most influential innovations in the field of computer vision. CNN performed a lot better than traditional computer vision algorithms. Convolution Neural Network enjoyed great success for Image Classification. There exist large domain differences between natural images and document images. For example, in natural image, the object of interest can appear in any region of the image. In contrast, many document images are 2D entities that occupy the whole image. So question arises whether the same architecture of CNN is also optimal for document images. The answer is big 'YES'. Thanks to the beauty of CNN we can use it for natural image classification as well as document image classification.

- **Named Entity Recognition:**
  NER is a part of natural language processing (NLP) and information retrieval (IR). The task in NER is to find the entity-type of words. Entities can, for example, be locations or names. Conditional Random Field machine learning algorithm is used to recognized the named entities.

- **Novelty Detection:**
  The objective of novelty detection is to decide new observation belongs to same distribution as existing observation or should be considered as different (Outlier). It is the Open set recognition, where all incomplete knowledge of the world is present at the training time and unknown samples can be submitted during testing. The novelty detection is the process where the training data is not polluted by outliers and we are interested in detecting anomalies in new observation. One-class Support Vector Machine is used for Novelty detection.

- **Multi-Object Recognition using Deep Learning:**
  The objective of this project is focused on multiple object detection and recognition from single image. YOLO (You Only Look Once) and SSD (Single Shot Detector) are used for this purpose. YOLO and SSD are based on Deep Learning.

- **Face Recognition and Matching:**
  In this project multiple face detection and recognition is possible. The project is also enhanced to detect the face from the document and matching can be done among faces from two different documents. The implementation is done in python using two libraries dlib and Face Recognition.

- **Image Caption Generation:**
  Image Caption Generation is a challenging Artificial Intelligent problem. It generates the textual description of image. It requires methods from computer vision to understand the content of image and Language model from the field of natural language processing to turn the understanding of image into words in right order. To understand the content of image VGG-16 model is used. VGG-16 is the trained model developed by Oxford's Visual Geometry Group. Recurrent Neural Network is used for the generation of Language model.

  Note: All the Projects implemented in Python.

RESEARCH WORK

- **Ph.D Research Work**

  Research Title: Brain Computer Interface for Silent Speech Recognition

  Description: Silent Speech Systems with natural speech production without using sound, can be used by a person who has lost the voice, but can produce subvocal visible speech with articulatory movement without air emission. During imagined speech, the subjects have to imagine pronouncing the word without moving muscles or producing sounds. Imagined speech concept based on the task that can be named as "Speak What You Thought".

- **Funded Research Work**

  Research Title: Unattended Object Intelligent Detection in Complex Scene

  Description: The research work focuses on the problem of finding the unattended object in public places such as shopping malls, airports, railway stations etc. The automated analysis of unattended objects in relation to human behavior in the surrounding area is the subject of this project, with the aim to explore efficient algorithms. The system consists of three major components i.e Video Acquisition, Video Processing and Unattended object detection.

- **Master's of Engineering Research Work**

  Research Title: Handwritten Character Recognition using Modified Fuzzy Hyperline Segment Neural Network

  Description: The research deals with simple and effective set of features for character representation. These features are computed within regularly placed windows spanning the character bitmap, consist of a combination of average pixel density and measures of local alignment along some directions. NIST database and Devnagari digit databases are used for experimentation. These features used in conjunction with Modified Fuzzy Hyperline Segment Neural network.

PAPER PUBLICATION

1. Dipti Pawar, Sudhir Dhage ,"Feature Extraction Methods for Electroencephalography based Brain-Computer Interface: A Review.", IAENG International Journal of Computer Science, 2020

2. Dipti Pawar, Sudhir Dhage, "Multiclass Covert Speech Classification using Extreme Learning Machine", Biomedical Engineering Letter-Springer , 2020.

3. Dipti Pawar, Sudhir Dhage, "DWT-based Imagined Speech Recognition based on Electroencephalography", International Journal of Biomedical Engineering and Technology (IJBET-Inderscience), 2019.

4. Dipti Pawar, Sudhir Dhage, "Recognition of Unvoiced Human Utterances Using Brain-Computer Interface", IEEE ICIIP, 2017.

5. Dipti Pawar, "GPU based Background Subtraction using CUDA:State of the Art", IEEE WISPNET, 2017.

6. Snehal Wagh, Dipti Pawar, "GPU Parallelization of Back-Propagation Neural Network", International Journal of Engineering Science and Innovative Technology,vol.6, issue 1,pp. 98-102,2017.

7. Dipti Pawar, "Fuzzy Min-Max Neural Network with Compensatory Neuron Architecture for Invariant Object Recognition", IEEE IC4, 2015.

8. Paras Tolia, Dipti Pawar, "Object Recognition using Compensatory Fuzzy Min-Max Neural Network Architecture", IJARCCE,vol.2, No.10, July 2013.

9. Shilpa Bane, DR Pawar, "Survey on Feature Extraction methods in Object Recognition", International Journal of Computer Science and Information Technologies, vol.5.

10. Shilpa Bane, D.R.Pawar, "Color Object Recognition using General Fuzzy Min-Max Neural network" ,IJCCN, Vol. 3, No.6, 2014.

11. Dipti Pawar, "Extended Fuzzy Hyperline Segment Neural Network for Handwritten Character Recognition", IMECS- IAENG,pp.43-46, 2012.

WORKSHOPS/ STTP/ FDP/SEMINAR ATTENDED

- One Week GIAN – workshop on Brain Computer Interfaces for Speech Communication: Theory and Applications by IIT, Guvahati, 2018.

- Two days FDP on 'Emerging Research Trends in Computing, Communication and Storage', by ZCOE,Pune, 2017.

- One day FDP on 'Smart System Design and Applications', by JSPM, Pune, 2016.

- Two days Workshop on 'Advanced Statistical Methods and Software tools for the Analysis of Data', by BVCOE, Pune,2016.
- One week TEQIP sponsored STTP on 'Privacy Preserving Data Mining' by SVNIT Surat, 2015.
- One week TEQIP sponsored STTP on ' Image Processing and Machine Learning ' by SCOE Pune, 2015.
- One day Workshop on 'Latex', by SCOE, Pune,2014.
- One week TEQIP sponsored STTP on ' Embedded Image Processing ' by SCOE Pune, 2013.
- One week workshop on 'Research in Engineering', by SCOE,Pune,2012.
- One day Seminar on 'Current Research Trends in Computer Engineering, by MESCOE, Pune,2012.
- One week International workshop on 'Information Security', Bits Pilani, 2012.
- Two weeks AICTE sponsored workshop on 'Machine Learning', 2011.
- One week workshop on 'Scilab', by Bits Pilani, 2011.

INTERACTION WITH OUTSIDE WORLD

- As a speaker - various topics like Machine Learning, Deep Learning in training programs.
- As a reviewer for the various Journals and Conferences.

PERSONAL DETAILS

Gender	:	Female
Skills Known	:	Python, R, Matlab
Languages Known	:	Hindi, Marathi and English (Read, Write and Speak)
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