

RGM College of Engineering and Technology (Autonomous), Nandyal
Department of CSE (Data Science)
2020-24 Batch – IV Year – II Semester – Project Presentations – Phase 1

List of activities to present to their project supervisors:

1. Team information

S1	Registered Number	Name	Team Leader	Project Supervisor, Designation, Department	Project Co-supervisor, Designation, Department
1	20091A3251	B. Suresh Kumar Reddy	B. Suresh Kumar Reddy	Dr. M. Suleman Basha, Associate Professor, CSE(DS)	Ms. A. Annapurna, Assistant Professor, CSE(DS)
2	20091A3229	M. Nandeeswar			
3	20091A3212	B. Dharani			

2. Title of the Project

Multi-disease detection system with X-ray images using Deep Learning Techniques

3. Source of the Project

“COV-VGX: An automated COVID-19 detection system using X-ray images and transfer learning” Elsevier by Prottoy Saha, Muhammad Sheikh Sadi, O.F.M. Riaz Rahman Aranya, Sadia Jahan, Ferdib-Al Islam.

[Paper_Link: COV-VGX: An automated COVID-19 detection system using X-ray images and transfer learning - ScienceDirect](#)

Journal: Informatics in Medicine Unlocked

Volume: 26

Year of published: 2021

The paper introduces COV-VGX, a deep learning-based COVID-19 detection system utilizing chest X-ray images. Employing transfer learning with the VGG-16 pre-trained model, the system incorporates both multiclass and binary classifiers for automated prediction of coronavirus, pneumonia, and normal

classes. Despite limited COVID-19 dataset availability, extensive experiments demonstrate remarkable performance with a multiclass classifier.

4. Any supporting sources

[1]“COVIDGR dataset and COVID-SDNet methodology for predicting COVID-19 based on chest X-ray images” IEEE by Tabik, S. and Gómez-Ríos, A. and Martín-Rodríguez, J. L. and Sevillano-García, I. and Rey-Area, M. and Charte, D. and Guirado, E. and Suárez, J. L. and Luengo, J. and Valero-González, M. A. and García-Villanova, P. and Olmedo-Sánchez, E. and Herrera,
<https://doi.org/10.1109/JBHI.2020.3037127>.

[2] “Convolutional capsnet: A novel artificial neural network approach to detect COVID-19 disease from X-ray images using capsule networks” ScienceDirect by Suat Toraman, Talha Burak Alakus, Ibrahim Turkoglu
<https://www.sciencedirect.com/science/article/pii/S0960077920305191>

5. Work done so far, such as literature survey

Author	Methodology	Features	Challenges
Liva Faes; Xiaoxuan Liu; Pearse A Kean, The Lancet Digital Health, October 2020	A comparison of deep learning performance against health-care professionals in detecting diseases from medical imaging: a systematic review and meta-analysis	Critically appraise the current state of diagnostic performance by deep learning algorithms for medical imaging.	Limited amount of dataset.
Pushpa Singh; Narendra Singh; Krishna Kant Singh; Akansha Singh, Machine Learning and the Internet of	Diagnosing of disease using machine learning	Helps to verify this data and foretell that everything from sickness outbreaks to severe infectious diseases.	Dependency on real data leads to data scarcity.

Medical Things in Healthcare, 2021			
Yuanyuan Pan; Minghuan Fu; Biao Cheng; Xuefei Tao; Jing Guo, IEEE Access ,May 2020	Enhanced Deep Learning Assisted Convolutional Neural Network for Heart Disease Prediction.	The predictions are very fast.	It is Computationally expensive
M. Chen, Y. Hao, K. Hwang, L. Wang and L. Wang, IEEE Access, 2020	Disease prediction by machine learning over big data from healthcare communities	Prediction accuracy of our proposed algorithm reaches 94.8% with a convergence speed which is faster than that of the CNN-based unimodal disease risk prediction (CNN-UDRP) algorithm.	If the images involves some degree of changes or angle changes, then CNNs find it difficult in classifying the image.
Alexander Selvikvag; Lundervold; Arvid Lundervold; Katarzyna WęgrzynWolska, Zeitschrift für Medizinische Physik, May 2020	An overview of deep learning in medical imaging focusing on MRI	Results in close to state-of-the-art performance on 2D object detection.	3D CNN's are a comparatively new concept and yet to be like 2D's.

- Conducted a literature survey, collecting relevant papers from IEEE and Science Direct.
- Identified existing work and outlined future works.

- Completed requirements analysis, including detailed and high-level requirements, and ensured validation.
- Analysed design requirements, covering component design, data flow, and evaluating interfaces between system components.

6. Division of project into tasks

Task	Team Member	Concepts involved	Technologies involved
Identification of beneficiary domain	B. Suresh Kumar Reddy	Literature survey	-
Identification of papers in IEEE, ScienceDirect	M. Nandeeswar	Literature survey	-
Identification of existing work and future scope	B. Dharani	Literature survey	-
Detailed Requirement analysis	B. Suresh Kumar Reddy	Requirement analysis	-
Identifying objectives, diagrams and implementing design	B. Suresh Kumar Reddy	Design	-
Gathering data from different sources	M. Nandeeswar	Data Collection	Kaggle, Github, SIRM databases
Cleaning data and visualizing the data	M. Nandeeswar	Data preprocessing and Exploratory data analysis	Numpy, Pandas, Matplotlib
Splitting the data into train and test	M. Nandeeswar	Data splitting	sklearn
Train and implement the DL models	B. Suresh Kumar Reddy	Development Phase	Transfer Learning, Fully Connected layers, VGG-16, AlexNet, CNN

Evaluate the performance	B. Suresh Kumar Reddy	Performance Metrics	Confusion Metrics
Implement the user interface	B. Dharani	Frontend	HTML, CSS
Set up the Flask environment for the backend framework	B. Dharani	Backend	Flask
Conduct system testing and model deployment	M. Nandeewar	Testing	Unittest, pytest
Gathering feedback from the project supervisor, Co-supervisor, and department head.	B. Suresh Kumar Reddy	Iterative Feedback	-

7. Work plan/ schedule (should be in line with the Project Calendar)

Week	Activity
08.01.2024 to 12.01.2024	Supervisors Review-1: Literature Survey <ul style="list-style-type: none"> • Identification of papers in IEEE, ScienceDirect, and Elsevier. • Identification of existing work and future scope in selected papers.
15.01.2024 to 20.01.2024	Gathering the data from different sources
22.01.2024 to 27.01.2024	Data preprocessing and Exploratory data analysis
29.01.2024 to 03.02.2024	Department Review - 1
05.02.2024 to 10.02.2024	Identifying the DL models
12.02.2024 to 17.02.2024	Development Phase -1 Train and implement the models
19.02.204 to 24.02.2024	Calendar Review -1
26.02.2024 to 02.03.2024	Development Phase -2 Develop the models and evaluate performance metrics

04.03.2024 to 09.03.2024	Supervisors Review -2 Implement the architecture of the models and analyze them.
11.03.2024 to 16.03.2024	Development Phase -3 Setup experimental analysis and Front-end techniques
18.03.2024 to 23.03.2024	Department Review -2
25.03.2024 to 30.03.2024	Development Phase -4 Set up the Flask environment at the backend.
01.04.2024 to 06.04.2024	Supervisors Review -3 Establish data flow from the backend to the front end for dashboards. Develop data analysis dashboards.
08.04.2024 to 13.04.2024	Department Review - 3
15.04.2024 to 20.04.2024	Testing and deployment
22.04.2024 to 27.04.2024	Calendar Review -2
29.04.2024 to 30.04.2024	Project Report submission to the department
01.05.2024 to 05.05.2024	External Viva Voce

8. Work distribution for each member

Team Member	Task	Technologies
B. Suresh Kumar Reddy(20091A3251)	Literature survey, Exploratory Data Analysis, DL models, Performance metrics	Matplotlib, Transfer Learning, CNN, Fully Connected layers, VGG-16, AlexNet, confusion metrics, Sklearn, Kears, Tensorflow
M. Nandeewar(20091A3229)	Data Collection and preprocessing, Unit Testing, Integration Testing	Numpy, pandas, pytest
B. Dharani(20091A3212)	Frontend and Backend design	HTML, CSS, Flask

9. Skillset of each member to match their allocated work,

Example:

Team Member	Data Collection	Deep Learning Modelling	Backend	Frontend	Data Analysis (Preprocessing)	DL Algorithms	Unit Testing	Integration Testing
B. Suresh Kumar Reddy	✓	✓	✓	✓	✓	✓	✓	✓
M. Nandeeswar	✓	✓	✓		✓		✓	✓
B. Dharani	✓	✓		✓		✓	✓	✓

10. Supervisor's remarks.

Signatures

Member – 1: Team Leader: B. Suresh Kumar Reddy

Member – 2: M. Nandeeswar

Member – 3: B. Dharani

Date: 09-01-2024

Signature
(Project Coordinator)

Signature
(Co-Supervisor)

Signature
(Supervisor)

Signature
HoD, CSE (Data Science)