Notice for the PhD Viva Voce Examination

Mr Denny Dominic (Registration Number: 1870083), PhD scholar at the School of Engineering and Technology, CHRIST (Deemed to be University), Bangalore will defend his PhD thesis at the public viva-voce examination on Tuesday, 07 March 2023 at 9.30 am in the CDI Conference Room, Block V, Bangalore Kengeri Campus, Bengaluru 560074.

Title of the Thesis	:	**A Multi Parameterized Modified Local Binary Pattern for Lung Cancer Detection by Deep Learning Methods**
Discipline	:	**Computer Science and Engineering**
External Examiner (Outside Karnataka)	:	**Dr K Suresh Joseph** Associate Professor Department of Computer Science Pondicherry University, (Central University) R Venkat Raman Nagar, Kalapet Pondicherry - 605014
External Examiner (Within Karnataka)	:	**Dr Jagadeesh Pujari** Professor and Head Department of Information Science and Engineering SDM College of Engineering and Technology Dharwad Karnataka
Supervisor	:	**Dr Balachandran K** Professor Department of Computer Science and Engineering School of Engineering and Technology CHRIST (Deemed to be University) Bengaluru – 560074 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva.

Registrar

Place: Bengaluru
Date: 16 February 2023

ABSTRACT

The research work focusing on developing a classification model for Lung Cancer detection by integrating the image features with Modified Local Binary pattern, Modified Principal component analysis, symptoms and Risk factors using Deep Learning methods and converting the image features into three dimensional (3D) images. The focus of this research is to identify the malignant and normal cells from the Computer Tomography (CT) images with improved accuracy. The 2D CT images of Lung cancer patients have been preprocessed with different filtering methods and processed with the Zero component analysis for whitening, Modified Local Binary pattern and this processed image is used in the research for classification. The Lung Cancer dataset used in the research are real time dataset. The dataset also contain CT images with Lung Cancer and without Lung Cancer. The research is conducted by integrating the selected Image features, Risk factor and symptoms of Lung Cancer of the same patients. The Integration using feature selections is carried out with Modified Principal component analysis (MPCA).

The modified principal component analysis is used in the research to reduce the time complexity. The Linear discriminate analysis (LDA) also is used in the research. The results are evaluated with Gini coefficient, Confusion Matrix and ROC curve. In the research Two Dimensional (2D) CT images are converted into a Three Dimensional (3D) image for the clarity and the visibility of Lung Cancer nodules. The conversion from 2D to 3D have used with combining two methods, the orthogonality and visualization of 4D rotation with selected image features. The conversion of the CT image into three dimensional images gave the visibility to find the location of the Lung Cancer from different angle and with different viewpoints. The 3D image shows the location of the Lung Cancer by Four Dimensional (4D) visualization and 3D rotation, thus giving clarity to the existing 2D images. Based on the research conducted an improvised algorithm (MPCA) and Modified Local Binary Pattern (MLBP) developed which has given an improved performance.

Keywords: Lung Cancer, Deep Learning, CT scan, Gini Index, Confusion Matrix

Publications:

1. **Denny Dominic** and K. Balachandran, “Early Prediction of Lungs Cancer by Deep Learning Algorithms from the CT Images with LBP Features”, International Journal of Advanced Science and Technology, Vol. 29, No.4, (2020), pp. 4200 - 4204.
2. **Denny Dominic** and K. Balachandran, “Lung Cancer Diagnosis from Ct Images Based on Pre-Processing and Ensemble Learning”, International Journal of Recent Technology and Engineering, ISSN: 2277-3878, Volume-8 Issue-4, November 2019.
3. **Denny Dominic** and K. Balachandran, “Mining Heterogeneous Lung Cancer from Computer Tomography (CT) Scan with the Confusion Matrix”, Wiley Publications (In Press)
4. **Denny Dominic** and K. Balachandran, “A Proven mathematical Model to explore the details in an image with Local Binary Pattern distribution (LBP)”, springer.https://www.springer.com/series/15179 (In Press)
5. **Denny Dominic** and K. Balachandran, “A Novel Method in Mining Heterogeneous Lung Cancer from Computer Tomography (CT) Scan”, Journal of Cardiovascular Disease Research (In Press)