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Notice for the PhD Viva Voce Examination

Ms K P Kavitha, Registration Number: 2071306, PhD Scholar at the Department of Computer Science, School of Sciences, CHRIST (Deemed to be University) will defend her PhD thesis at the public viva-voce examination on Thursday, 04 June 2026 at 10.30 am in Room No. 044, Ground Floor, R&D Block, CHRIST (Deemed to be University), Bengaluru - 560029, Karnataka, India.

- Title of the Thesis** : **A Computational Approach to Industry Standard Handwritten Data Extraction from Unstructured Data Using Word Beam Search Algorithm and Language Modeling**
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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-voce examination.

Registrar (Academics)

Place: Bengaluru
Date: 27 May 2026

ABSTRACT

This research addresses the growing need for efficient digitization of handwritten information within document-intensive domains, particularly in the mortgage industry, where documents often contain a combination of printed and handwritten content. The proposed system integrates advanced neural architectures, combining Convolutional Neural Networks (CNNs) for hierarchical feature extraction and Bidirectional Long Short-Term Memory (BiLSTM) networks for sequential modelling. A pre-trained VGG16 model is employed through transfer learning to capture complex visual patterns in handwritten text, improving generalization across diverse handwriting styles. The model adopts a segmentation-free approach and utilizes the Connectionist Temporal Classification (CTC) loss function.

To further enhance decoding accuracy, the study incorporates Word Beam Search (WBS), which leverages lexicon constraints to generate contextually meaningful predictions. In addition, a domain-specific language model tailored to mortgage documentation is integrated to refine recognition outputs by incorporating contextual and semantic understanding of field-specific vocabulary. The framework is evaluated on multiple datasets, including domain-specific mortgage data, demonstrating superior performance compared to traditional and baseline deep learning models. Experimental results indicate notable improvements in recognition accuracy, along with substantial reductions in Word Error Rate (WER) and Character Error Rate (CER). The study also examines the influence of hyperparameters, optimization strategies, and regularization techniques on model performance.

In conclusion, the proposed deep learning-based HTR framework presents a scalable and efficient solution for handwritten data extraction in domain-specific environments.

Keywords: Handwritten Text Recognition, Deep Learning, CNN, BiLSTM, VGG16, CTC, Word Beam Search, Mortgage Documents, OCR, Language Model.

Publications:

1. **Kavitha Ananth** and Kirubanand V. B, (2021). Handwritten Text Recognition using Deep Learning and Word Beam Search. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(2), 2905–2911.
2. **Kavitha Ananth** and Kirubanand V.B , "Building an Industry Standard Novel Language Model Using Named Entities," 2022 International Conference on Trends in Quantum Computing and Emerging Business Technologies (TQCEBT), Pune, India, 2022, pp. 1-6, doi: 10.1109/TQCEBT54229.2022.10041678.
3. **K P Kavitha** and Kirubanand.V.B, "Extraction of Handwritten Text using Word Beam Search Algorithm and Language Modeling", ijmst, vol.10, no.2, pp.2786-2795,Jul.2023.
4. **P.Kavitha** & B, Kirubanand. (2025). Performance Evaluation of Transfer Learning VGG16 in Handwritten Text Using Word Beam Search and Language Model. Journal of Internet Services and Information Security. 15. 536-551. 10.58346/JISIS.2025.I2.037.
5. UNSTRUCTURED DATA EXTRACTION SYSTEM USING MULTI HEAD ATTENTION AND A NOVEL LANGUAGE MODEL, K.P.Kavitha, Kirubanand V. B et al , Patent Published 2022, Received Grant on 28 Mar 2025.