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Notice for the PhD Viva Voce Examination

Ms Fizhan Kausar, Registration Number: 2170232, 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 Friday, 30 January 2026 at 11.30 am in Room No. 628, 6th Floor, R&D Block, CHRIST (Deemed to be University), Bengaluru - 560029, Karnataka, India.

Title of the Thesis	:	**A Framework for Prediction of Abnormalities of Growing Children with Congenital Kidney Disorders Using AI Techniques**
Discipline	:	**Computer Science**
External Examiner - I	:	**Dr Surendiran B** Professor Department of Computer Science and Engineering National Institute of Technology Karaikal - 609609 Puducherry
External Examiner - II	:	**Dr Venkanna Udutalapally** Associate Professor Department of Computer Science and Engineering National Institute of Technology Warangal - 506004 Telangana
Supervisor	:	**Dr Ramamurthy B** Associate Professor Department of Computer Science School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 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 – voce examination.

Place: Bengaluru
Date: 21 January 2026

Registrar (Academics)
Registrar (Academics)
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ABSTRACT

Accurate classification of pediatric kidney abnormalities using ultrasound imaging plays a critical role in early diagnosis and treatment planning. However, the high dimensionality of extracted texture features and variability in image quality present major challenges for reliable classification. This thesis proposes an enhanced feature selection framework based on a binary version of the Coati Optimization Algorithm hybridized with Weighted Mean Vector (eBinCoWmv), aimed at reducing feature redundancy while maximizing classification accuracy. The
research investigates the effect of multiple binary transfer functions, S-shaped and V-shaped, on the binarization performance of the optimizer. Extensive experiments using CEC'22 Test Suite benchmark functions (CEC'01–CEC'10) and real-time pediatric kidney ultrasound datasets demonstrate that the V1 transfer function consistently outperforms others in terms of convergence stability and classification performance. The selected features were evaluated using six machine learning classifiers, with XG-Boost and Random Forest achieving the highest accuracy, precision, and AUC scores. The proposed eBinCoWmv model not only improves computational efficiency by selecting fewer, more relevant features but also enhances diagnostic accuracy. The results validate
the robustness, adaptability, and clinical relevance of the proposed hybrid optimization-driven classification framework for pediatric kidney disease classification.

Keywords: *Pediatric kidney abnormalities, Ultrasound image classification, Feature selection, Binary Coati Optimization Algorithm, Weighted Mean Vector, eBinCoWmv, Transfer functions, Metaheuristic optimization, Machine learning classifiers.*

Publications:

1. **F. Kausar** and B. Ramamurthy, Explainable AI and Feature Based Technique for the Classification of Kidney Ultrasound Images," International Journal of Electrical and Computer Engineering (IJECE) (Scopus Published, Q3)
2. **F. Kausar** and B. Ramamurthy, "Coati Optimization Algorithm for Detecting Pediatric Kidney Abnormalities using Ultrasound Images," International Research Journal of Multidisciplinary Scope (IRJMS), vol. 6, no. 2, pp. 874–884, Apr. 2025, doi: 10.47857/irjms.2025.v06i02.03236 (Scopus Published, Q4)
3. **F. Kausar** and B. Ramamurthy, "Machine Learning Based Optimal Feature Selection for Pediatric Ultrasound Kidney Images Using Binary Coati Optimization," International Journal of Intelligent Engineering & Systems, 2024, Vol 17, Issue 6, p1300, doi : 10.22266/ijies2024.1231.94. (Scopus Published, Q2)
4. **F. Kausar** and B. Ramamurthy, "Transforming Pediatric Healthcare with CKD using AI: A Systematic Mapping," 2023 IEEE International Conference on Contemporary Computing and Communications (InC4), Bangalore, India, 2023, pp. 1-7, doi: 10.1109/InC457730.2023.10263186. (Scopus Published)
5. **F. Kausar** and R. B, "Optimizing Kidney Ultrasound images through Pre-Processing Filters," 2023 First International Conference on Advances in Electrical, Electronics and Computational Intelligence (ICAEECI), Tiruchengode, India, 2023, pp. 1-6, doi: 10.1109/ICAEECI58247.2023.10370900.(Scopus Published)