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Notice for the PhD Viva Voce Examination

Ms Namitha T N, Registration Number: 2072419, PhD Scholar at the School of Engineering and Technology, CHRIST (Deemed to be University), will defend her PhD thesis at the public viva-voce examination on Monday, 09 November 2026, at 10.30 am in CDI Conference Room, Block V, Bangalore Kengeri Campus, CHRIST (Deemed to be University), Bengaluru - 560074, Karnataka, India.

Title of the Thesis	:	**Prediction of Intravenous Immunoglobulin Resistance in Kawasaki Patients Using Federated Learning**
Discipline	:	**Computer Science and Engineering**
External Examiner - I	:	**Dr Arun Kumar M N** Professor Department of Computer Science and Engineering Federal Institute of Science and Technology Mookkannoor, Angamaly - 683577 Keralam
External Examiner - II	:	**Dr Vijay Kumar** Associate Professor Department of Information Technology Dr B R Ambedkar National Institute of Technology Grand Trunk Road, Jalandhar Punjab - 144008
Supervisor	:	**Dr Raghavendra S** Associate Professor Department of AI and Data Science Engineering School of Engineering and Technology Bangalore Kengeri Campus 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–voce examination.

Registrar (Academics)

Place: Bengaluru
Date: 28 October 2026

ABSTRACT

Kawasaki disease is a rare pediatric vasculitic condition and a leading cause of acquired heart disease in children. Administration of intravenous immunoglobulin (IVIG) is the globally accepted treatment, but a minority of patients exhibit resistance to this treatment. These patients account for 10–20% of cases and have been observed to be vulnerable to coronary artery abnormalities. This makes the early prediction of IVIG resistance imperative for timely treatment and effective disease management. Artificial intelligence offers a potential avenue for addressing the above concerns. This research offers complementary AI-based approaches for accurate and privacy-preserving IVIG resistance prediction. First, a Multimodal Transformer Embedding Fusion and Oversampling (MTEFO) framework combines sentence-transformer and tabular-transformer embeddings to capture complex relationships among clinical features. The proposed MTEFO-RF model demonstrated improved predictive performance across two independent clinical datasets. Second, a federated learning framework implemented using Flower employs a one-dimensional convolutional neural network as the shared model, enabling collaborative training without centralizing patient data. Finally, an adaptive intermediate model selection mechanism in federated learning addresses client-level variation by allowing each client to retain either the final global model or the intermediate global model that achieves its best recall or F1-score.

Keywords: *Kawasaki Disease, Coronary Artery Abnormalities, Transformer Embedding, Multimodal Transformer Embedding Fusion, Minority Oversampling, Federated Learning.*

Publications:

1. **Namitha, T. N.**, Raghavendra, S., and Vinith, R. (2025). "Privacy-Preserving Federated Learning for Prognostic Modeling in Rare Diseases: A Scalable Case Study on Kawasaki Disease." International Journal of Online and Biomedical Engineering (iJOE), 21(11), pp. 66–80. https://doi.org/10.3991/ijoe.v21i11.56385
2. **Namitha, T. N.**, Raghavendra, S., and Vinith, R. (2026). "Federated Learning with Adaptive Intermediate Model Selection for Predicting IVIG Resistance in Kawasaki Disease." International Journal of Online and Biomedical Engineering (iJOE), 22(02). https://doi.org/10.3991/ijoe.v22i02.58737
3. **Namitha, T. N.**, Raghavendra, S., and Vinith, R. (2026). "Intravenous Immunoglobulin Resistance Prediction in Kawasaki Disease Using Oversampled Transformer Embeddings." IAES International Journal of Artificial Intelligence (IJ-AI), 15(4), pp. 3944–3954. https://doi.org/10.11591/ijai.v15.i4.pp3944-3954
4. **Namitha, T. N.**, Raghavendra, S., and Vinith, R. (2024). "Privacy-Preserving Federated Learning in Healthcare: Fundamentals, State of the Art and Prospective Research Directions." In Proceedings of the 2024 IEEE 3rd World Conference on Applied Intelligence and Computing (AIC), Gwalior, India, pp. 1438–1443. https://doi.org/10.1109/AIC61668.2024.10730929
5. **Namitha, T. N.**, Raghavendra, S., and Vinith, R. (2025). "Privacy-Preserving Federated Learning: Foundations and Algorithmic Directions." In J.C. Bansal, S. Saha, C. A. C. Coello, and H. Rathore (Eds.), Advances in Data-Driven Computing and Intelligent Systems: ADCIS 2024, Lecture Notes in Networks and Systems, Vol. 1333. Springer, Singapore. https://doi.org/10.1007/978-981-96-4536-7_23.