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# Notice for the PhD Viva Voce Examination

Mr Norton Stanley S A, Registration Number: 1981308, PhD Scholar at the Department of Computer Science, School of Sciences, CHRIST (Deemed to be University) will defend his PhD thesis at the public viva-voce examination on Monday, 04 May 2026 at 10.30 am in Room No. 628, 6th Floor, R&D Block, CHRIST (Deemed to be University), Bengaluru - 560029, Karnataka, India.

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| **Title of the Thesis** | : | **Machine Learning Enabled Advanced Resiliency Pattern for Optimizing Microservice Fault Tolerance** |
| **Discipline** | : | **Computer Science** |
| **External Examiner - I** | : | **Dr M Venkatesan**<br>Associate Professor<br>Department of Computer Science and Engineering<br>National Institute of Technology Puducherry<br>Karaikal - 609609<br>Tamil Nadu |
| **External Examiner - II** | : | **Dr Saroj Kr Biswas**<br>Associate Professor<br>National Institute of Technology Silchar<br>Ghungoor NIT Road<br>Silchar - 788118<br>Assam |
| **Supervisor** | : | **Dr Shoney Sebastian**<br>Professor<br>Department of Computer Science<br>School of Sciences<br>CHRIST (Deemed to be University)<br>Bengaluru - 560029<br>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:** 24 April 2026

# ABSTRACT

Microservice-based applications are inherently prone to runtime failures due to inter-service dependencies. Traditional techniques frequently rely on reactive resiliency patterns, such as a Circuit Breaker pattern which prevents consecutive failures by stopping requests from flowing to the faulty service. While this ensures that the system is not overloaded with consecutive requests but may impact the functionality of the application. To address this gap, this study offers a proactive resilience paradigm that improves the fault tolerance of cloud microservices. The first part of this work proposes an ECD pattern a novel technique that routes requests based on real-time variables such as latency, error rates, and availability, automatically switching to a deconstructed state to ensure that an alternative path maintains service continuity and eliminates downtime for end users. The second part of this research enhances the ECD pattern by incorporating machine learning models to proactively predict anomalies in cloud microservices enabling the pattern to switch to alternative paths and maintain continuous service availability. Experimental evaluation demonstrates that the proposed ECD framework significantly improves fault tolerance, reduces downtime, and ensures uninterrupted service continuity in large-scale cloud microservice environments.



**Keywords:** *Elastic Circuit De-constructor, Cloud microservices, Cloud native, Resiliency pattern, Machine learning, Zero Downtime, Fault tolerance, High availability*


**Publications:**

1. **S. A. Norton Stanley** and Shoney Sebastian, "Elastic circuit de-constructor: a pattern to enhance resiliency in microservices," International Journal of Computers and Applications, vol. 46, pp. 1–12, Aug. 2024, doi: 10.1080/1206212x.2024.2397018.
2. **S. A. Norton Stanley** and Shoney Sebastian, "Proactive Elastic Circuit Deconstructor: A Machine Learning-Driven Resiliency Pattern for Microservices" International Journal of Advances in Signal and Image Sciences (IJASIS)
3. **S. A. Norton Stanley** and Shoney Sebastian, "A Systematic Review on the Identification and Classification of Patterns in Microservices," in Proc. of 4th International Conference for Emerging Technology (INCET), Belgaum, India, 2023, pp. 1-8, doi: 10.1109/INCET57972.2023.10170375. (Scopus Published)
4. **S. A. Norton Stanley** and Shoney Sebastian, "Circuit Breaker: A Resilience Mechanism for Cloud Native Architecture," in Proc. of Global Conference on Information Technologies and Communications (GCITC), Bangalore, India, 2023, pp. 1-8, doi: 10.1109/GCITC60406.2023.10426195. (Scopus Published)
5. Pradeep. G. Gowda, **S. A. Norton Stanley** and J. Eskaline Joyce, "DevOps Dynamics: Tools Driving Continuous Integration and Deployment," in Proc. of IEEE International Conference on Information Technology, Electronics and Intelligent Communication Systems (ICITEICS), Bangalore, India, 2024, pp. 1-7, doi: 10.1109/ICITEICS61368.2024.10624986. (Scopus Published)
6. G. Dhanakshirur, **S. A. Norton Stanley**, et al., "Cloud Computing I/O Thread Performance Optimization with VirtIO and Queue Size Tuning," in Proc. of IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bangalore, India, 2024, pp. 1-5, doi: 10.1109/CONECCT62155.2024.10677048. (Scopus Published)