

**HYBRID TRANSFER LEARNING MODELS FOR
VIDEO ANOMALY DETECTION IN SURVEILLANCE SYSTEMS**

The thesis submitted in partial fulfillment of the degree of

**DOCTOR OF PHILOSOPHY
IN
COMPUTER SCIENCE AND ENGINEERING**

By

SREEDEVI R. KRISHNAN

(Reg. No. 19PHEOP005)

Supervisor

Dr. P. AMUDHA

Professor

**Department of Computer Science and Engineering
School of Engineering**

**Avinashilingam Institute for Home Science and Higher Education
for Women, Coimbatore**

MARCH 2025

80_RECOMMENDATION

- Future studies can be extended to explore on improving the accuracy and consistency of Anomaly Detection (AD) models by incorporating additional contextual information. Utilizing a versatile dataset, such as a combination of audio, video and sensor inputs, can offer an insight of anomalies in depth.
- Expanding datasets to encompass a wider space of scenarios, activities and environmental conditions, such as night-time surveillance combined with progressive data augmentation techniques, can significantly improve model generalizability.
- Research may also prioritize real-time scalability, explainability through Explainable AI (XAI) and privacy-compliant frameworks. Leveraging generative AI models, such as GANs or diffusion models, can help generate training data to address class imbalance and enhance model generalization.
- Reducing error rates in diverse conditions is vital to enhancing Anomaly Detection reliability and advancing its applications in public safety, traffic monitoring and critical infrastructure protection.