

## CERTIFICATE

I certify that the thesis entitled “**Exploring the Effectiveness of Deep Learning Based Object Detection in Augmented Reality for Remote Learning**” submitted for the award of **Doctor of Philosophy (Ph.D.)** by **Mrs. Arthi D** is the record of research work carried out by her during the period from **July 2019 to September 2025** under my guidance and supervision, and that this work has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other Titles in this Institute or any other University or Institution of Higher Learning.

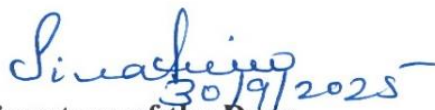
  
30/9/2025

Signature of the

Head of the Department

  
30/9/2025


Signature of the Supervisor

  
30/9/2025

Signature of the Dean

## DECLARATION

I, **Mrs. Arthi D** hereby declare that the thesis entitled “**Exploring The Effectiveness of Deep Learning Based Object Detection in Augmented Reality for Remote Learning**” submitted by me for the award of Doctor of Philosophy (Ph.D.) is the record of the work carried out by me during the period from July 2019 to September 2025 under the guidance of **Dr. S. Sivakumari** M.E., Ph.D., Professor and Dean, School of Engineering, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship, Titles in this Institute or any other University or other similar Institution of Higher Learning.

  
Signature of the Supervisor

  
Signature of the Research Scholar

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## LIST OF ABBREVIATIONS

AR	- Augmented Reality
OBE	- Outcome Based Education
AI	- Artificial Intelligence
ML	- Machine Learning
SLAM	- Simultaneous Location and Mapping
VSLAM	- Visual Simultaneous Location and Mapping
3D	- Three Dimension
CLAHE	- Contrast Limited Adaptive Hierarchical Equalization
CNN	- Convolutional Neural Network
MRCNN	- Mask Region-based Convolutional Neural Network
XR	- Extended Reality
CSUQ	- Computer System Usability Questionnaire
MML	- Mobile Micro Learning
DTW	- Digital Twin Module
HOE	- Holographic Optical Elements
HUD	- Head Up Display
IMO	- International Marine Organization
BRDF	- Bidirectional Reflectance Distribution Function
ETL	- Electrically Focus-Tunable Lenses
DL	- Deep Learning
PPE	- Personal Protective Equipment
SH	- Spherical Harmonics
IBL	- Image Base Lighting
CV	- Computer Vision