

## **CERTIFICATE**

I certify that the thesis entitled “**A Deep Learning Framework for Detection and Segmentation of Multiple Artefacts in Endoscopic Images**” submitted for the degree of Doctor of Philosophy (Ph.D.) in Electronics and Communication Engineering, is the record of research work carried out by **Mrs. N. Kirthika (19PHELF001)** during the period of her study from July 2019 to May 2023 in the Department of Electronics and Communication Engineering at Avinashilingam Institute for Home Science and Higher Education for Women Coimbatore, under my guidance and supervision and the thesis has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or any other similar titles of any candidate of this Institute or any other University / Institution of Higher Learning.

**Signature of the HoD**

**Signature of the Supervisor**

**Signature of the Dean**

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## LIST OF ABBREVIATIONS

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AFI	- Auto Fluorescent Imaging
AI	- Artificial Intelligence
AP	- Average Precision
API	- Application Programming Interface
ASFF	- Adaptively Spatial Feature Fusion
AutoML	- Automated Machine Learning
BCE	- Binary Cross Entropy
BiFPN	- Bi-Directional Feature Pyramid Network
BoF	- Bag of Freebies
BoS	- Bag of Specials
CAD	- Computer Aided Diagnostic
CIFAR	- Canadian Institute For Advanced Research
CIoU	- Complete Intersection over Union
CLAHE	- Contrast-Limited Adaptive Histogram Equalization
CmBN	- Cross mini-Batch Normalization
CNN	- Convolutional Neural Network
CPU	- Central Processing Unit
CRC	- Colo Rectal Cancer
CSP	- Cross Stage Partial
CUDA	- Compute Unified Device Architecture
CV	- Computer Vision
DBN	- Deep Belief Networks
DCN	- Deformable Convolution Network
DDR	- Double Data Rate
DL	- Deep Learning
DLA	- Deep Layer Aggregation
DNN	- Deep Neural Network
DPM	- Deformable Part Model
EAD	- Endoscopic Artefact Detection

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FAIR	- Facebook AI Research
FCN	- Fully Connected Network
FCOS	- Fully Convolutional One Stage
FN	- False Negative
FP	- False Positive
FPN	- Feature Pyramid Network
GAN	- Generative Adversarial Network
GB	- Giga Bytes
GI	- Gastro Intestinal
GPU	- Graphical Processing Unit
HD	- High Definition
HOG	- Histogram of Oriented Gradients
HSV	- Hue Saturation Value
IHEC	- Institute Human Ethical Committee
IMDb	- Internet Movie Database
IoU	- Intersection over Union
LSTM	- Long Short-Term Memory
mAP	- mean Average Precision
ME	- Magnifying Endoscopy
ML	- Machine Learning
MLP	- Multi-Layer Perceptron
MNAS	- Mobile Neural Architecture Search
MNIST	- Modified National Institute of Standards and Technology
MSCOCO	- Microsoft Common Object in Context
NAS	- Neural Architecture Search
NBI	- Narrow Band Imaging
NLP	- Natural Language Processing
NMS	- Non-Max Suppression
PAN	- Path Aggregation Network
PDM	- Pyramid Dilated Modules
RAM	- Random Access Memory

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RBFN	- Radial Bias Function Network
RBM	- Restricted Boltzmann Machine
R-CNN	- Region based Convolutional Neural Network
ReLU	- Rectified Linear Unit
RGB	- Red Green Blue
RNN	- Recurrent Neural Network
RoI	- Region of Interest
RPN	- Region Proposal Network
SAT	- Self-Adversarial Training
SE	- Squeeze and Extraction
SFAM	- Scale-wise Feature Aggregation Module
SIFT	- Scale Invariant Feature Transform
SLIC	- Simple Linear Iterative Clustering
SPP	- Spatial Pyramid Pooling
SSD	- Single Shot Detector
SVM	- Support Vector Machine
SOM	- Self-Organizing Map
TP	- True Positive
t-SNE	- t-distributed Stochastic Neighbour Embedding
VGG	- Visual Geometry Group
VIA	- VGG Image Annotator
WCE	- Wireless Capsule Endoscopy
YOLO	- You Only Look Once

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