

**IRIS RECOGNITION BIOMETRIC  
USING TRANSFER LEARNING AND  
CONVOLUTIONAL NEURAL NETWORKS**

**A PROJECT REPORT**

*Submitted by*

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*in partial fulfillment for the award of the  
degree of*

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRONICS AND COMMUNICATION ENGINEERING**

**T. J. S. ENGINEERING COLLEGE PUDUVOYAL**



**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**



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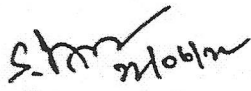


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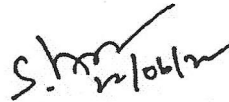
BONAFIDE CERTIFICATE

Certified that this project report "IRIS RECOGNITION BIOMETRIC USING TRANSFER LEARNING AND CONVOLUTIONAL NEURAL NETWORK" is the bonafide work of "OVIYA E (112818106019), SARANYA K (112818106029) SUBHIKSHA S (112818106033), SABITHA R (112818106304)" who carried out the project work under my supervision.



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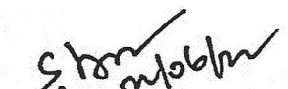
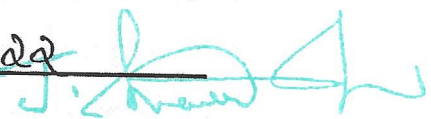


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Submitted for the examination held on

22-06-22



Internal Examiner



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## ABSTRACT

Iris is one of the common biometrics used for identity authentication. It can identify people, with a high degree of assurance. However, when iris images have unconstrained conditions or are obtained without the cooperation of the subjects, the quality of iris images is reduced by noises such as optical and motion blur, off-angle view, specular reflection (SR), and other artifacts, thus ultimately deteriorating the recognition performance. Extracting effective features is the most crucial step in the iris recognition system. The success of deep learning in computer vision problems has paved the way for convolutional neural networks (CNN) in iris recognition systems. This project proposes an end-to-end deep learning framework for an effective iris recognition system based on convolutional neural network (CNN) and transfer learning which is implemented by fine-tuning a pre-trained ALEXNET for feature extraction and classification that can jointly extract the features and perform recognition. We train our model on a well-known iris dataset using only a few training images from each class and test them to detect whether the iris is real or fake. Several biometric systems have incorporated iris recognition in the past, but the real question lies in two parameters: the efficiency and the number of iterations required.



A handwritten signature in blue ink, appearing to read "J. K. Srinivasan".

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~~OBJECTIVES~~ The student should be made:

- To gain knowledge about the various physiological parameters both electrical and non electrical and the methods of recording and also the method of transmitting these parameters
- To study about the various assist devices used in the hospitals
- To gain knowledge about equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.

**UNIT I ELECTRO-PHYSIOLOGY AND BIO-POTENTIAL RECORDING 9**

Sources of bio medical signals, Bio-potentials, Biopotential electrodes, biological amplifiers, ECG, EEG, EMG, PCG, typical waveforms and signal characteristics

**UNIT II BIO-CHEMICAL AND NON ELECTRICAL PARAMETER MEASUREMENT 9**

pH, PO<sub>2</sub>, PCO<sub>2</sub>, Colorimeter, Blood flow meter, Cardiac output, respiratory, blood pressure, temperature and pulse measurement, Blood Cell Counters.

**UNIT III ASSIST DEVICES 9**

~~Cardiac~~ pacemakers, DC Defibrillator, Dialyser, Ventilators, Magnetic Resonance Imaging Systems, Ultrasonic Imaging Systems.

**UNIT IV PHYSICAL MEDICINE AND BIOTELEMETRY 9**

Diathermies- Shortwave, ultrasonic and microwave type and their applications, Surgical Diathermy, Biotelemetry.

**UNIT V RECENT TRENDS IN MEDICAL INSTRUMENTATION 9**

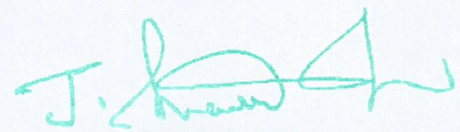
Telemedicine, Insulin Pumps, Radio pill, Endomicroscopy, Brain machine interface, Lab on a chip

**TOTAL:45 PERIODS**

**OUTCOMES:** On successful completion of this course, the student should be able to:

- Know the human body electro- physiological parameters and recording of bio-potentials
- Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.
- Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators
- Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies, and bio-telemetry principles and methods
- Know about recent trends in medical instrumentation



  
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