



Anand Nagar, Krishnankoil - 626126, Srivilliputtur (via), Virudhunagar District, Tamilnadu.

APPLICATION FOR ADMISSION TO Ph.D. PROGRAMMES

Date of Application:24-10-2025

Department	ELECTRONICS AND COMMUNICATION ENGINEERING	Application No.	2025010486
Area of Research	ELECTRONICS	Research Mode	PART TIME

Name :SINDHU K
Date of Birth / Age :01-06-1970 / 55 Years
Gender :FEMALE
Category :SC
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Mobile :09495877099



Sindhu

Father's/Husband's Name	SIVAJI P	Father's/Husband's Occupation	GOVT SERVENT
Family Income	18,00,000/-	Residential Type	URBAN
Birth Place	THIRUVANANTHAPURAM	Mother Tongue	MALAYALAM
Religion	HINDU	Martial Status	MARRIED
Aadhaar No.	739238920358	PAN No.	ACAPK2154M
Physically Challenged	NO	Type of Disability	-
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Qualification						
Degree	Discipline	College/university	Year Passed	AVG/CGPA	Class	Mode
M.SC	ELECTRONICS SCIENCE	COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY	1993	64.9	1 ST	REGULAR

Experience					
Organization	Designation	Experience From	Experience TO	Work Nature	
INSTITUTE OF HUMAN RESOURCES AND DEVELOPMENT (IHRD) , GOVT OF KERALA UNDER TAKING.	LECTURER	1994-07-21	2009-02-11	TEACHING	
IHRD, GOVT OF KERALA UNDER TAKING.	PRINCIPAL	2009-02-12	2025-10-24	ADMINISTRATION	

Payment Details				
Transaction ID	Reference	Date of transaction	Amount	Status
2025010486_251113213348	BEP7OPS1277XCR	13-11-2025	600	SUCCESS

Research Proposal

Title: AI-Enabled Human Activity Recognition and Wearable Systems for Cancer Care and Early Detection

1. Introduction

Wearable computing is increasingly becoming an integral part of modern life due to its compact size, affordability, and powerful computational capabilities. Equipped with a variety of sensors, wearable devices can continuously monitor a user's physiological and behavioral parameters such as walking, sleeping, or heart rate. This has enabled significant progress in Human Activity Recognition (HAR), a key area in artificial intelligence (AI) and healthcare technology.

HAR systems have immense potential in developing assistive and preventive healthcare technologies, particularly for chronic disease management and patients with special needs. Extending this technology to cancer care and detection represents a promising direction for personalized medicine and remote health monitoring.

2. Background and Motivation

Cancer remains one of the leading causes of death globally. Early detection and continuous patient monitoring can greatly improve treatment outcomes. However, traditional diagnostic and monitoring methods often require clinical visits and specialized equipment.

Recent advances in AI, deep learning, and wearable sensors enable real-time collection and analysis of physiological and behavioral data. Integrating HAR with AI-based biomedical data analysis can help:

Detect subtle changes in daily activity patterns that may indicate fatigue or disease progression.

Support remote monitoring of cancer patients undergoing therapy.

Assist in early detection of abnormal physiological signals associated with cancer-related conditions.

This study aims to combine HAR and AI-driven biomedical analytics to build an intelligent wearable system for cancer care and early detection.

3. Objectives

1. To design and develop a deep learning-based HAR model capable of recognizing human activities with high accuracy.
2. To integrate biomedical signal analysis (e.g., heart rate, temperature, oxygen level) into HAR frameworks for comprehensive patient monitoring.
3. To explore AI models for detecting anomalies in sensor data that may indicate cancer-related physiological changes.

4. To create a prototype wearable system that supports continuous monitoring and early alerting for patients under cancer care.

4. Methodology

1. Data Acquisition:

Use publicly available HAR datasets and biomedical signal datasets (e.g., UCI HAR, PhysioNet).

Collect real-time sensor data through wearable devices (accelerometer, gyroscope, temperature, ECG, SpO₂).

2. Preprocessing:

Clean and normalize sensor data.

Perform segmentation and feature extraction (time, frequency, and spatial domains).

3. Model Development:

Implement deep learning architectures such as CNN, LSTM, and hybrid CNN-LSTM networks for activity recognition.

Train AI models for detecting deviations or patterns associated with cancer symptoms (fatigue, motion abnormalities, irregular vitals).

4. Integration and Evaluation:

Develop a unified framework integrating HAR and cancer care analytics.

Evaluate model performance using metrics such as accuracy, sensitivity, specificity, and F1-score.

5. Expected Outcomes

A robust AI-based HAR model for real-time human activity recognition.

A wearable prototype system capable of continuous monitoring of cancer patients.

A decision-support framework for healthcare professionals to assess patient well-being remotely.

Contribution to the development of AI-assisted cancer care technologies and e-health systems like Ambient Assisted Living (AAL).

6. Significance

This research bridges wearable technology, HAR, and AI-based healthcare analytics, enabling a new dimension of personalized, preventive cancer care. The integration of deep learning with wearable sensing can revolutionize how early detection and patient monitoring are conducted, reducing healthcare costs and improving quality of life.

Register No. 404



FACULTY OF TECHNOLOGY

The Academic Council of the Cochin University of Science and Technology hereby makes known that Lindhu K.

is admitted to the Degree of

MASTER OF SCIENCE

under the Faculty of Technology, ~~he~~/she having undergone the prescribed course of study in Electronics Science and having been certified by duly appointed examiners to be qualified to receive the same, and placed by them in the First Class at the Examination held in January 1993.

Given under the Seal of the University, this day, the 19th January 1994.

University Buildings,
Cochin - 682 022



Shubh Kumar!
Vice-Chancellor.

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

KOCHI-682 022

No **014**

Dated 3-4-1993

MEMORANDUM

The following is the statement of marks awarded to
 Shri/Smt Sindhu K
 at the M.Sc Fourth (Final) Semester Examination in Electronics Science held in January 1993

Register Number 404

SUBJECT	Marks Awarded	Minimum Marks required for a pass	Maximum Marks
4 MS ₁ Robotics II Written Sessional Total	28 32 60	50	50 50 100
4 MS ₂ Artificial Intelligence - II Written Sessional Total	14 40 54	50	50 50 100
4 MS ₃ Seminar Sessional	70	50	100
4 MS ₄ Project work/Viva-Voce Written Sessional Total	155 88 243	150	200 100 300
TOTAL FOR IV SEMESTER	427	300	600
Carried forward from			
I Semester Examination	364	300	600
II Semester Examination	357	300	600
III Semester Examination	411	300	600
GRAND TOTAL	1559	1200	2400

Marks entered by [Signature]
 Marks checked by [Signature]
 Section Officer [Signature]



[Signature]

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Cochin - 682 022



Shubh Kumar!
Vice-Chancellor.

UNDERTAKING

I, Sindhu K, presently working as Principal, College of Applied Science Puthuppally, Kottayam, under the aegis of the Institute of Human Resources Development (IHRD), a Government of Kerala undertaking, do hereby state that I had joined IHRD as Lecturer in Electronic Science on 21st July 1994, and was promoted as Principal in 2009.

I hereby undertake that I will produce my experience certificate issued by IHRD at the time of admission.

Thiruvananthapuram

13.11.25



Sindhu K
Principal,

रथाई लेखा संख्या /PERMANENT ACCOUNT NUMBER

ACAPK2154M



नाम /NAME

SINDHU KUNNATHUKAL

पिता का नाम /FATHER'S NAME

MANOHARAN DAMODARAN

जन्म तिथि /DATE OF BIRTH

01-06-1970

10/11/2018

हस्ताक्षर /SIGNATURE

S. Shukla

आयकर आयुक्त, तिरुवनंतपुरम

COMMISSIONER OF INCOME-TAX, TRIVANDRUM



सत्यमेव जयते

Indian Union Driving Licence Issued by State of Kerala

KL

DL No. KL01 20140006665

Issue Date	Validity (NT)	Validity (TR)
08-07-2014	31-05-2030	



Name : SINDHU K

Date Of Birth : 01-06-1970 Blood Group : A+

Organ Donor : No

S / D / W of : SIVAJI P


Holder's Signature

Permanent Address

HOUSE NO-139,
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Present Address

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THIRUVANANTHAPURAM,695014

Date Of First Issue 08-07-2014



1. Name of pupil..... SINDHU. K......
(In English. Block letters. Initials after name)

..... സിന്ധു. കെ......
(In Regional Language)

2. Sex... Female..... 3. Nationality... Indian.....

4. Religion... Hindu..... 5. Caste... Sambavar.....

6. Native place... Kunmalbukal - Neyyattinkara.....

7. Date of birth (In Christian Era)
(In figures and in words)..... 1-6-1970.....

First June Nineteenhundred and
Seventy/

8. Name of father... D. Manoharan.....

9. Name of parent or guardian :
(As in the Admission Register) .. D. Manoharan.....

Guardian's relationship with
the pupil : .. Father.....

Occupation of guardian : .. Government Servant.....

Home address of guardian : .. N.G.O. Qrs. No. D. 3/A.....

..... Netaji Nagar, Trivandrum.....

10. Personal marks of identification :

1. .. A Scar on the fore-head.....

2. .. A black spot on the left lower arm.....

11. Schools attended	Period of study		Standards
	From	To	
Govt H.S for Girls, Cottonhill, Trivandrum	1982	1983	VIII
	1983	1984	IX
	1984	1985	X

I certify that I have checked all the entries in this S. S. L. C. with reference to the relevant records of the school and found them correct.

ANNAMMA GEORGE. 20/3/85

Name and signature of Headmaster/Headmistress
with date

..... Govt. High School for Girls.....
Cottonhill, Trivandrum

