



06.01.2021

Trichy.

To

The Project Manager,  
Hitakey Infosys,  
Melachinthamani,  
Tiruchirappalli,  
Tamil Nadu-625002

Dear Sir/Madam,

**Sub:** Requisition letter for short-term project -Reg.

Greetings!

Indra Ganesan College of Engineering, Manikandam, Tiruchirappalli, Tamil Nadu was established with a noble vision of providing higher education in the field of Engineering for the student community, especially from the rural areas.

Indra Ganesan College of Engineering, Trichy is one of the institutions affiliated with Anna University, Chennai. Our institution promotes and encourages the students to undergo short-term projects to cultivate their practical knowledge to bridge the gap between industry and academic curriculum.

Students of the Electronics Communication Engineering department are interested to do short term project related to Wireless communication field with the facilities available in our college. We had experience faculty members had completed many short term project and already we had completed the project in your organization in previous year. I request you to accept our request and guide them to achieve their goal. The goodwill of your organization is always going to add value to the student's resumes.



  
**Dr.S.BHARATHI RAJA**  
PRINCIPAL



**Dr. G. Balakrishnan, M.E., Ph.D.,**  
Principal

Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.

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igceprincipal@gmail.com



Trichy

11.01.2021

To

The Principal,  
Indra Ganesan College of Engineering,  
Madurai Main Road (NH-45B), Manikandam,  
Trichy – 620 012

Dear sir/Madam,

Sub: Invitation to collaborate on a Short term project endowment “Wi-Fi based location Identification using Raspberry Pi.”

We are excited to accept your invitation from Electronics and Communication department of Indra Ganesan College of Engineering, Trichy to collaborate with us on a short-term project on “Wi-Fi based location Identification using Raspberry Pi.” in time period of Six weeks. Acknowledging and leveraging each other's strengths can indeed lead to great outcomes. By working together effectively, you can achieve more than what each of you could accomplish individually. Let us know your early convenient to explore the budget details to complete the “Wi-Fi based location Identification using Raspberry Pi” consultancy development. We are open to scheduling a meeting to discuss the project details in person or via a virtual platform.

For Hitahey Infosys

With Best Regards

  
Managing Director

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal

Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.



12.01.2021

Trichy.

To

The Project Manager,  
Hitakey Infosys,  
Melachinthamani,  
Tiruchirappalli,  
Tamil Nadu-625002

Respect Sir/Madam,

Sub: Submission of Short-term project endowment quotation – Reg

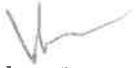
Ref.: Your Letter Dated 11.01.2021.

We would like to thank for considering our short-term project proposal. To follow up on your letter, the ECE Department has assigned team of 5 students with Project Investigator Dr.R.RajaMohamed to carry out the consultancy endowment for your esteemed organization. We would like to bring to your kind notice that the quotation for the consultancy endowment “**Wi-Fi based location Identification using Raspberry Pi.**” and may cost **Rs 75,000/-**. The quotation details and time line for each stage of work is presented below.


**FINANCIAL DETAILS**

S.NO	DESCRIPTION	TIME DURATION IN WEEKS	COST IN Rs
1.	Circuit Design	1 Week	10,000/-
2.	Sensor purchase	1 Week	15,000/-
3.	Development Phase	2 Weeks	25,000/-
4.	Product Testing and Delivery	1 Week	21,000/-
5.	Training and Documentation	1 Weeks	4,000/-
<b>Total</b>		<b>6 Weeks</b>	<b>75,000/-</b>

We commit to provide technical assistance from our end to ensure successful completion of project with prompt delivery and we are looking forward to your kind consideration of our consultancy endowment proposal. In this regard, we request you to contact us with any queries about the design and delivery of the project.

  
Project Investigator  
[Dr.R.Raja Mohamed]



  
Dr.S.BHARATHI RAJA  
PRINCIPAL

Madurai Main Road,  
NH-45B, Manikandam  
Tiruchirappalli – 620 012  
Tamil Nadu, South India

Dr. G. Balakrishnan, M.E., Ph.D.,  
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Trichy

18.01.2021

To

The Principal,

Indra Ganesan College of Engineering,

Madurai Main Road (NH-45B), Manikandam,

Trichy - 620 012

Dear Sir,

Sub.: Sanction of Fund for "Wi-Fi based location Identification using Raspberry Pi"-  
reg.

We really appreciate all of your hard work in making this consultancy endowment, and  
We are pleased to inform you that, we are accepted and approving a sum of Rs.75,000/- (Rupees  
Seventy five Thousand Only) towards the "Wi-Fi based location Identification using  
Raspberry Pi" project work. It is essential that the work is to complete within the stipulated  
time.

For Hitahey Infosys

With Best Regards

For HITAKEY INFOSYS

  
Proprietor  
Managing Director

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal  
Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.



10.03.2021

Trichy.

To

The Project Manager,  
Hitakey Infosys,  
Melachinthamani,  
Tiruchirappalli,  
Tamil Nadu-625002

Respect Sir/Madam,

Sub: Submission of Short term project endowment- Reg

Ref.: Your Letter Dated 18.01.2021

We are glad to let you know that the project “**Wi-Fi based location Identification using Raspberry Pi**” has been successfully completed. We wish to implement the same at your concern. In this regard, our team members will implement the successfully completed at your organization in your convenient date.

Kindly make arrangements and expecting your co-operation.

  
Project Investigator  
[Dr.R.Raja Mohamed]



  
Dr.S.BHARATHI RAJA  
PRINCIPAL



# Indra Ganesan

**COLLEGE OF ENGINEERING**

Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## SHORT TERM PROJECT ENDOWMENT REPORT

**Wi-Fi based location Identification using Raspberry Pi.**

*Submitted to*

The Project Manager  
Hitakey Infosys  
Melachinthamani  
Tiruchirappalli  
Tamil Nadu-625002

**Delivery Date: 10.03.2021**

**Dr. G. Balakrishnan, M.E., Ph.D.,**

Principal

Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.



16.03.2021

Trichy

**UTILIZATION CERTIFICATE**

Certified that the amount of Rs.75, 000/- (Seventy five Thousand Only) was sanctioned by Hitakey Infosys during the academic year (2020-2021), in favor of department of Electronics Communication Engineering, Indra Ganesan College of Engineering, Manikandam, Trichy for short term project endowment titled "**Wi-Fi based location Identification using Raspberry Pi**". The purpose of amount sanctioned has been fulfilled and delivered as per conditions of grant were satisfied.

  
Project Investigator  
[Dr.R.Raja Mohamed]



  
Dr.S.BHARATHI RAJA  
PRINCIPAL

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal

Indra Ganesan College of Engineering  
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# PROJECT REPORT

## Objective:

Ambient, non-intrusive approaches to smart home health monitoring, while limited in capability, are preferred by residents. More intrusive methods of sensing, such as video and wearables, can offer richer data but at the cost of lower resident uptake, in part due to privacy concerns. A radio frequency based approach to sensing, Channel State Information (CSI), can make use of low cost off-the-shelf Wi-Fi hardware. We have implemented an activity recognition system on the Raspberry Pi 4, one of the world's most popular embedded boards. The capabilities of the Raspberry Pi 4 at performing activity recognition on CSI data are investigated. We have developed and publicly released a data interaction framework, capable of interpreting, processing and visualizing data from a range of CSI-capable hardware. Furthermore, CSI data captured for these experiments during various activity performances have also been made publically available. We then train a Deep Convolutional LSTM model to classify the activities. Our experiments, performed in a small apartment, achieve 92% average accuracy on 11 activity classes.

## Project Description:

The aim is to identify whether the Pi 4 can effectively be used to perform ambient smart home activity recognition in a representative environment, as has been demonstrated is possible with IWL5300. To do this, a device configuration will be assembled to allow data to be collected. CSI data can then be captured as activities are performed in the environment. Once this data has been collected, a classification model can be trained on the labeled examples. The efficacy of this model can then be identified using labeled examples from the test set. This method is similar to how many deep learning activity recognition studies were performed using the IWL5300, however the Pi benefits from a deep learning approach as it has access to significantly more subcarriers. The device configuration for data collection can have a massive impact on the quality of the activity performance captures. The chosen configuration aligns with what would be expected in a realistic in-home monitoring scenario and is similar to those used in other CSI activity recognition studies.

## Conclusion

Our results confirm the Raspberry Pi 4 has capabilities for use in ambient activity recognition in smart homes, and can be deployed in similar environments to those used in studies using the IWL5300. It appears the Deep LSTM model is well-suited to the CSI data produced by the Pi 4. Potentially, other models may be worth investigating, such as auto encoder recurrent networks. An exciting aspect of these results is the performance observed when using the model with data captured at 10Hz. This potentially further reduces the cost of a Pi-based system for real-world deployment, allowing it to benefit from the existing Wi-Fi infrastructure in most organization.



**Dr. G. Balakrishnan, M.E., Ph.D.,**

Principal

**Indra Ganesan College of Engineering**

IG Valley, Madurai, Madurai Road

Manikandam, Trichy-620 012.