TALKING FINGERS (Ta – Fi)

A PROJECT REPORT

Submitted by,

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Under the guidance of,

Dr. Ananda Raj S P

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING, CYBER SECURITY

At

PRESIDENCY UNIVERSITY

BENGALURU

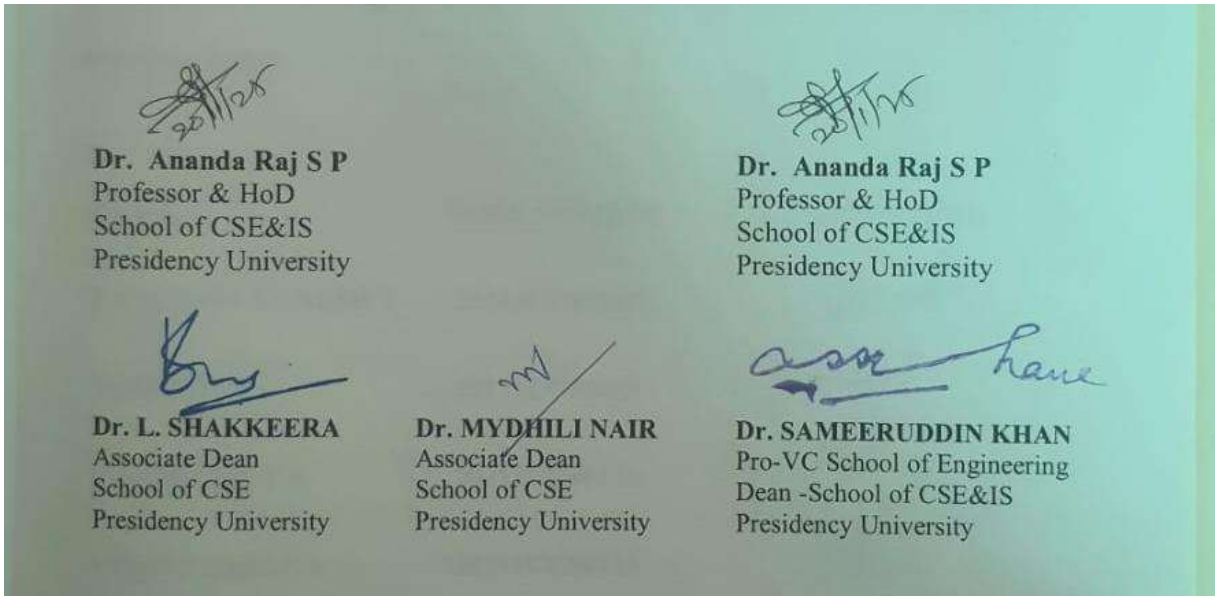
JANUARY 2025

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the Project report **"TALKING FINGERS (Ta – Fi)"**being submitted by "PANCHAM GANESH T, SHELDEN P, VARMITHA V S, VISHNU PRIAN S" bearing roll numbers "2011CCS0163, 20211CCS0143, 20211CCS0136, 20211CCS0115" in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a Bonafide work carried out under my supervision.



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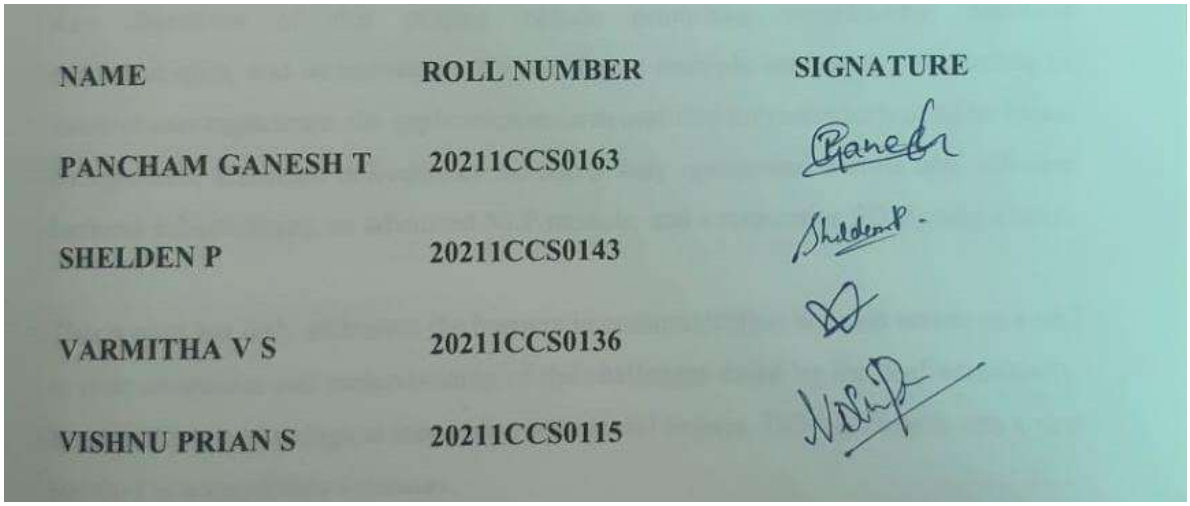
DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **"TALKING FINGERS (Ta – Fi)"** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Dr. Ananda Raj S P,** Professor & HOD**, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.



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ABSTRACT

The Talking Fingers (Ta-Fi) project introduces a revolutionary mobile application designed to bridge the communication gap between the hearing and the deaf or hard-of-hearing communities. This application transforms spoken language into Indian Sign Language (ISL) in real time, utilizing advanced Natural Language Processing (NLP) and a highly interactive 3D signing avatar. By translating speech into visually comprehensible ISL, Talking Fingers fosters inclusivity and seamless communication across diverse linguistic and cultural backgrounds.

The application architecture combines React Native for cross-platform compatibility and cloud-based services for scalability. Speech inputs are processed through high-quality APIs for speech-to-text conversion, followed by robust NLP techniques to interpret and structure the text according to ISL grammar. These processed inputs are rendered into ISL using deep learning models trained on extensive ISL datasets. The 3D avatar, capable of real-time signing with precise gestures and facial expressions, enhances user understanding and engagement.

Key objectives of this project include promoting accessibility, real-time communication, and inclusiveness. By catering to multiple languages and creating an intuitive user experience, the application ensures usability for individuals of all technical backgrounds. Expected deliverables include a fully operational mobile app, efficient backend infrastructure, an advanced NLP module, and a responsive 3D signing avatar.

This project not only addresses the barriers in communication but also serves as a tool to raise awareness and understanding of the challenges faced by the deaf community. By combining technological innovation with social impact, Talking Fingers sets a new standard in accessibility solutions.

ACKNOWLEDGEMENT

First of all, we indebted to the **GOD ALMIGHTY** for giving me an opportunity to excel in our efforts to complete this project on time.

We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan**, Pro-VC, School of Engineering and Dean, School of Computer Science Engineering & Information Science, Presidency University for getting us permission to undergo the project.

We express our heartfelt gratitude to our beloved Associate Deans **Dr. Shakkeera L and Dr. Mydhili Nair,** School of Computer Science Engineering & Information Science, Presidency University, and Dr. **Ananda Raj S P**, Head of the Department, Cyber Security, School of Computer Science Engineering & Information Science, Presidency University, for rendering timely help in completing this project successfully.

We are greatly indebted to our guide **Dr. Ananda Raj S P**, Head of the Department, Cyber Security, School of Computer Science Engineering & Information Science, Presidency University and Reviewer **Dr. Sharmasth Vali Y**, Professor, School of Computer Science Engineering & Information Science, Presidency University for his inspirational guidance, and valuable suggestions and for providing us a chance to express our technical capabilities in every respect for the completion of the project work.

We would like to convey our gratitude and heartfelt thanks to the PIP2001 Capstone Project Coordinators **Dr. Sampath A K, Dr. Abdul Khadar A and Mr. Md Zia Ur Rahman,** department Project Coordinators and Git hub coordinator **Mr. Muthuraj.**

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

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