



PRESIDENCY UNIVERSITY

Private University Estd. in Karnataka State by Act No. 41 of 2013
Itgalpura, Rajankunte, Yelahanka, Bengaluru - 560064



VoiceBridge: An AI-Powered Framework for Low-Cost Multilingual Video Dubbing into Indian Regional Languages

A PROJECT REPORT

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IN

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PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

Certified that this report "VoiceBridge: An AI-Powered Framework for Low-Cost Multilingual Video Dubbing into Indian Regional Languages" is a Bonafide work of "ANMARY JOJO (20221CSG0140), AQSA MEHEREEN D(20221CSG0118), AGAMPREET H (20221CSG0117)", who have successfully carried out the project work and submitted the report for partial fulfilment of the requirements for the award of the degree of BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND TECHNOLOGY during 2025-26.

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DECLARATION

We the students of final year B.Tech in COMPUTER SCIENCE AND TECHNOLOGY at Presidency University, Bengaluru, named **Annmary Jojo**, **Aqsa Mehareen D**, **Agampreeth H S**, hereby declare that the project work titled "**VoiceBridge: An AI-Powered Framework for Low-Cost Multilingual Video Dubbing into Indian Regional Languages**" has been independently carried out by us and submitted in partial fulfilment for the award of the degree of B.Tech in COMPUTER SCIENCE AND TECHNOLOGY during the academic year of 2025-26. Further, the matter embodied in the project has not been submitted previously by anybody for the award of any Degree or Diploma to any other institution.

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Abstract

VoiceBridge is an intelligent, scalable, and economically feasible multilingual dubbing framework that upgrades the accessibility of English video content for diverse Indian linguistic audiences. It focuses on South Indian languages like Kannada, Tamil, Telugu, and Malayalam. This system integrates state-of-the-art open-source AI technologies: Whisper for ASR, IndicTrans2 for NMT, and Coqui/Indic-TTS for high-quality TTS into an end-to-end pipeline that can perform transcription, translation, and speech generation with audio-video synchronization.

VoiceBridge focuses on aspects of cultural and linguistic naturalness, including prosody adaptation, regional accent customization, and cloning speaker voices to make the dubbed output relevant and engaging for native viewers. The framework will be designed in a user-friendly way, making it possible for individual users, educators, and content developers to translate and dub videos without requiring technical expertise or high financial resources.

Performance evaluation has been done based on Word Error Rate, Character Error Rate, speech naturalness scoring, and audio-lip sync accuracy. Our system returns a WER of 11.9% and CER of 11.09% with very minor synchronization errors of around 90 milliseconds. The results show good recognition and translation performance even for code-mixed speeches and region-specific pronunciations—common challenges in Indian multilingual scenarios.

By utilizing open-source models, VoiceBridge achieves a massive reduction in deployment cost and computational needs while making it feasible for low-resource settings and local institutions. The framework aims to bridge the digital language divide in India, thereby allowing inclusive access to educational, entertainment, and informational video content for millions of native speakers. With plans to enhance it for more regional languages, real-time dubbing, and emotion-aware synthesis in the near future, this represents an important step toward democratizing digital knowledge and preserving linguistic diversity.