# Executive Summary

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1. Title of the Project: Development of Instrumental Measures for Oral Skill in Any Language

2. Date of Start of the Project: October 1, 2020

3. Aims and Objectives: To research and develop a system that reliably predicts human expert judgements of oral skill in constrained speaking contexts, realized as a complete software implementation involving both device and cloud server components for assessment/monitoring as well as language training functions. The system would be flexible enough to be easily customized to new content and even a new language and usable by diverse groups of language learners across age groups, native tongues and skill levels.

4. Significant achievements (not more than 500 words to include List of patents, publications, prototype, deployment etc), Patents and Publications:

Patent filed: Indian patent examination report received and response submitted in December 2021. Patent Application No. 201921041761 titled 'SYSTEM FOR AUTOMATIC ASSESSMENT OF FLUENCY IN SPOKEN LANGUAGE AND A METHOD THEREOF'.

Publications:

(i) Kamini Sabu, Preeti Rao "Predicting Children's Perceived Reading Proficiency with Prosody Modeling", Computer Speech & Language 84 (2024): 101557.
(ii) Kalyan, P., Jyothi, P., Rao, P., & Bhattacharyya, P. (2024, March) "STORiCo: Storytelling TTS for Hindi with Character Voice Modulation. "In Proceedings of the 18th Conference of the European Chapter of the Association for Computational Linguistics (Volume 2: Short Papers) (pp. 426-431).
(iii) Raj Gothi, Preeti Rao "Improving Automatic Speech Recognition with Dialect-Specific Language Models", Speech and Computer: 25th International Conference, SPECOM 2023, Dharwad, India, November 29 – December 2, 2023, Proceedings, Part I (pp. 57-67).
(iv) Pavan Kalyan, Preeti Rao, Preethi Jyothi, Pushpak Bhattacharyya "Emotion Arithmetic: Emotional Speech Synthesis via Weight Space Interpolation", In Proceedings of Interspeech, 2024.

(v) Raj Gothi, Rahul Kumar, Mildred Pereira, Nagesh Nayak and Preeti Rao "A Dataset and Two-pass System for Reading Miscue Detection", In Proceedings of Interspeech, 2024.
(vi) Vaidya, M., Kumar Sahoo, B. and Rao,P. "Deep Learning for Assessment of Oral Reading Fluency" https://arxiv.org/abs/2405.19426
(vii) Patent filed: Indian patent examination report received and response submitted in December 2021. Patent Application No. 201921041761 titled 'SYSTEM FOR AUTOMATIC ASSESSMENT OF FLUENCY IN SPOKEN LANGUAGE AND A METHOD THEREOF'

Protoytpe and Deployment:

1. The TARA app ecosystem has matured into a stable and reliable system that facilitates classroom based testing for ORF and generates comprehensive data analytics for the entire cohort at various granularities of the widely accepted rubrics of WCPM, accuracy and expressiveness. These provide insights that can help achieve data-driven instruction design taking into account the identified categories of learners.

2. We have signed a one year paid contract with Kendriya Vidyalaya Sangathan for a year-long engagement (academic year of 2024-2025)for baseline-midline-endline ORF assessments for 6 grades (III to VIII) in English and Hindi across the 1200 schools in India. The baseline was completed in September 2024 and a report has been shared with KVS HQ. We are currently assisting with dissemination of the results of their class to teachers and interpretation of scores for remedial instruction design.

3. We have also provided paid access to our API to a private Edtech company in the B2C English language learning space for Grades K-8 for their own pilot with private schools. They have expressed interest in specific prosody features for expressive reading scoring and we plan to develop and deploy these soon.

4. We are in active discussion with UNICEF India for a joint proposal to their world body for an innovation award towards developing AI based tools for literacy and language education. The government of Rajasthan along with state-based NGO implementation partners have shown interest in collaborating with UNICEF and us on Hindi ORF assessment and instruction for government schools grades 3-6.

5. Concluding remarks

The project has progressed well as indicated by the ongoing paid deployments with the KVS schools that also look promising in terms of further growth of engagement. The insights that are coming our way from the now increased interaction with teachers and school administration are helping to prioritise directions for future development. The focus is now on the Hindi and English language reading assessment tools, and possibly also developing technology-aided learning elements. We are hoping to replicate the methodology with more languages including Marathi and Kannada. We are looking actively for more implementation partners. The support from the Fellowship has been enabling and is greatly appreciated.