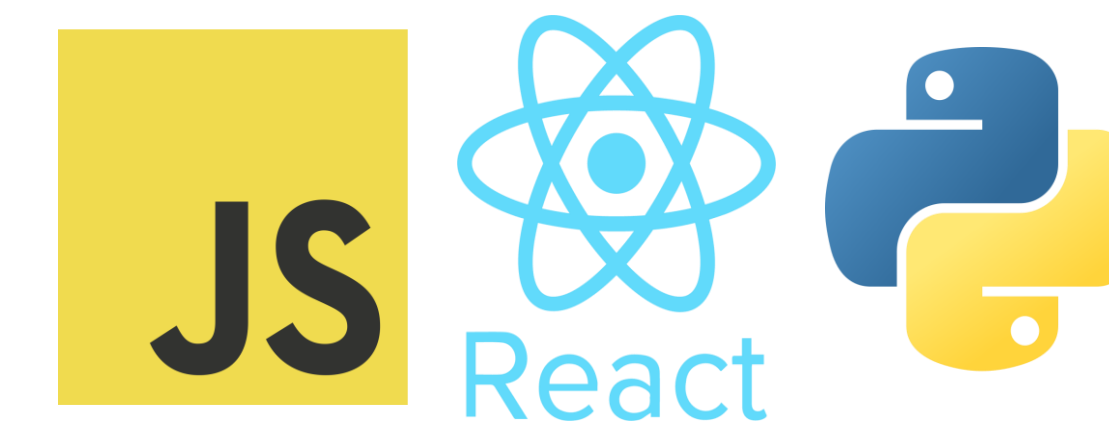# TeleHealth Insights
At-Home Language Assessment Tool, Improving Guidance and Outcomes for Clinicians, Parents and Children

Mitchell Weingust, Parisha Nizam, Jasmine Sun-Hu, Promish Kandel, Irene Ye Yuan

Department of Computing and Software, McMaster University, Hamilton, ON, Canada

Background

- Children with speech difficulties need regular assessments to monitor progress and adjust therapy
- Parents can help administer assessments at-home, but current tools are designed for in-person use and don't meet parents' needs

Overview

- TeleHealth Insights is an at-home language assessment tool that provides clear instructions and guidance for parents
- Emphasizes child-friendly engagement and interactions
- Provides readily accessible and structured assessment results for clinicians to view and analyze

Goals

Intuitive Parent Interface
Provides ease of navigation and set up

Engaging Child Interface
Simple and interactive platform, with bright colours and images for children of all ages

Reliable Clinician Dashboard
Provides valuable results and bias detection in an easy-to-read format

Data Security
Securely store and retrieve client data

Assessments

Matching
Match the image to the audio description played. Perfect for visual learners and pattern recognition.

Repetition
Repeating played audio sentences. Enhances listening and speaking skills.

Quantifier
Match objects with their corresponding quantifiers (Mandarin only).

Design

- **Extendable**: Abstract factory pattern allows for easy addition of new test types and languages
- **Modular**: Services are organized through a microservice architecture to compartmentalize information
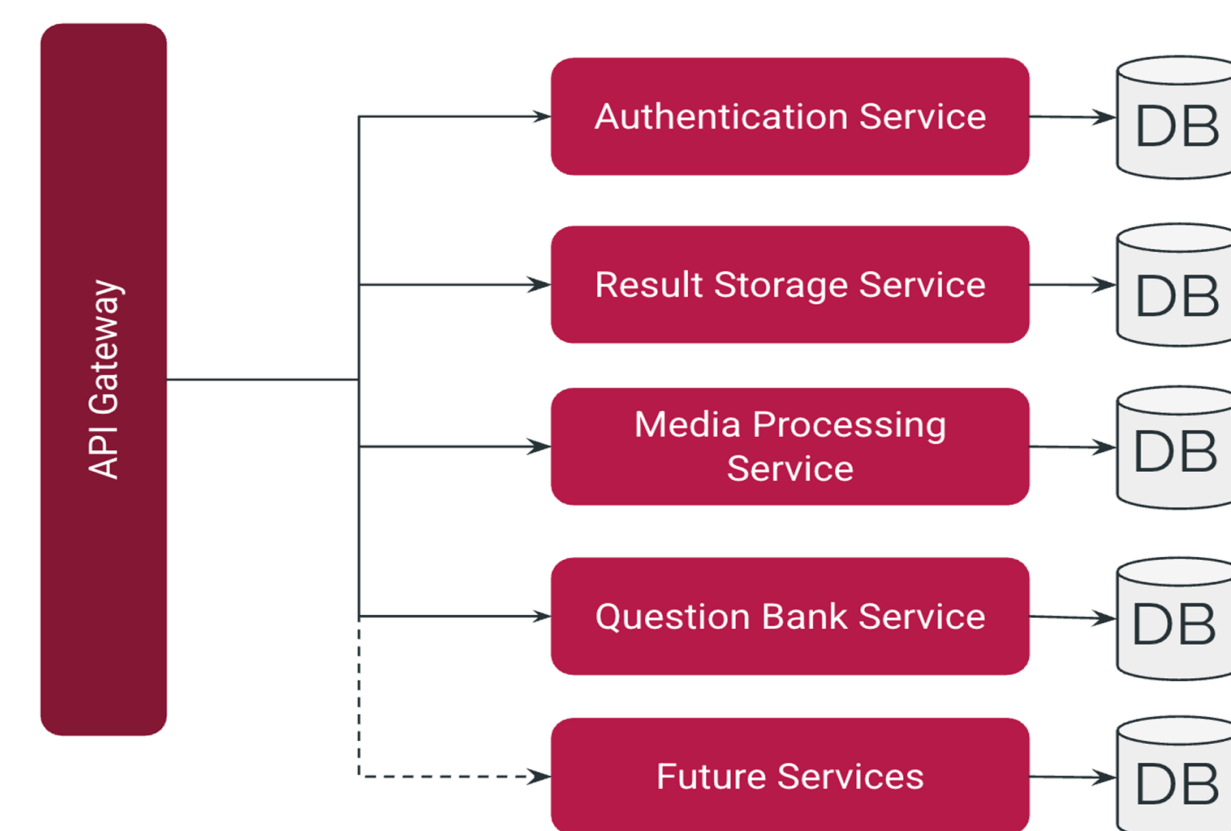
- **Reliable**: Decoupled assessment interface and recording uploads to allow asynchronous media processing and improve performance
- **Secure**: Industry standard encryption algorithms used for both in-transit (TLS 1.2) and at-rest (AES-256, Bcrypt) data
- **Controlled Access**: User permissions and access are defined by role designations

Client Overview
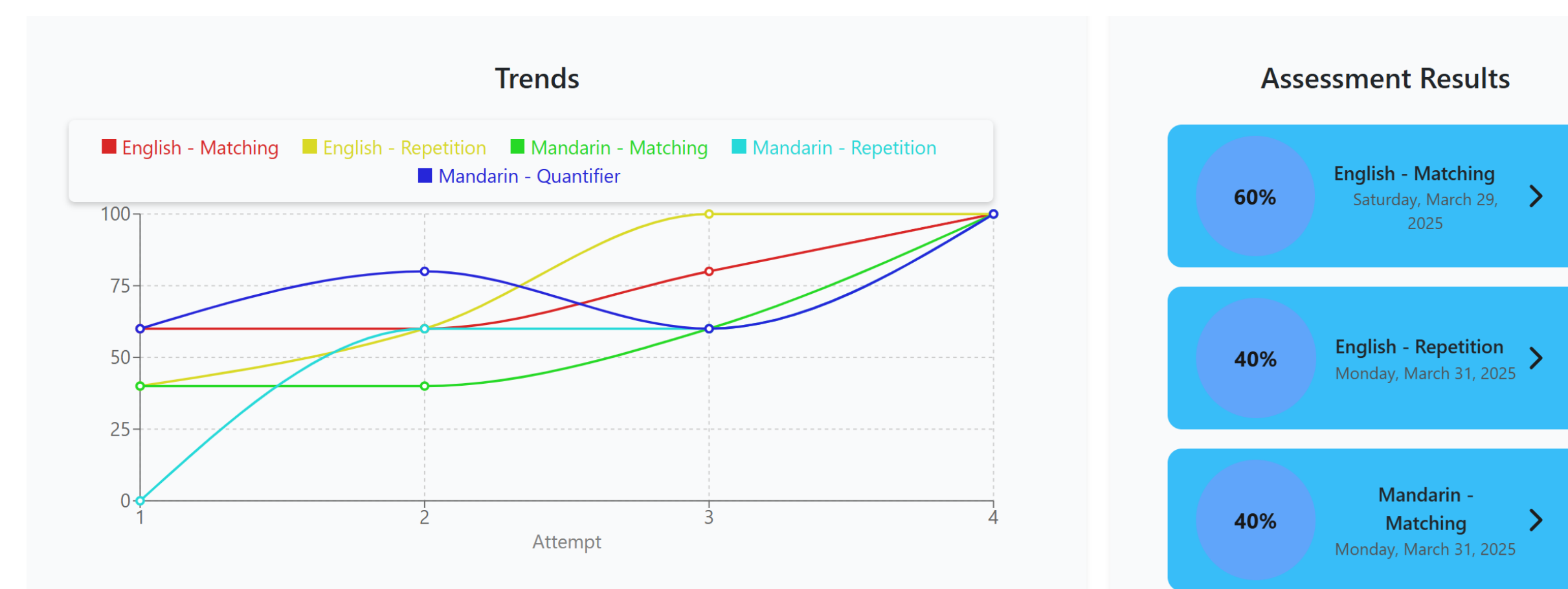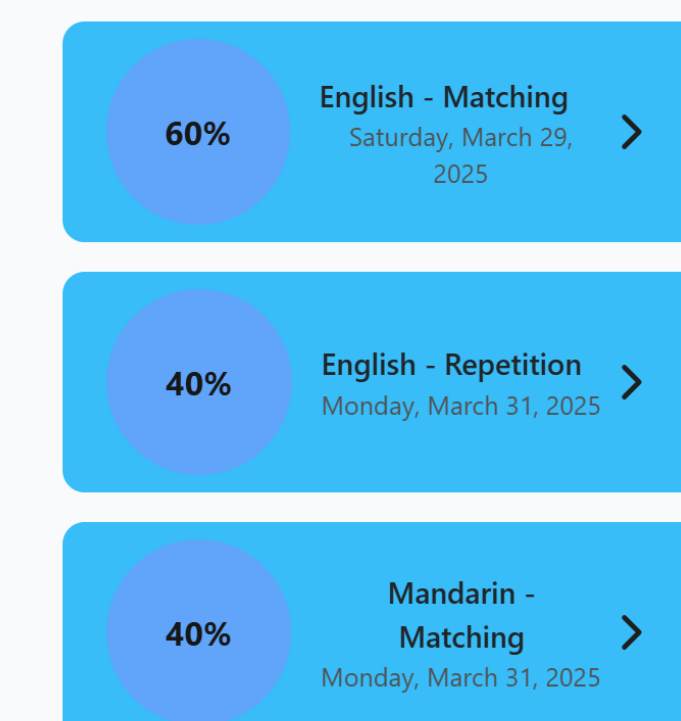
- Observe overall trends from past assessment results to see how clients perform over time
- Filter results by **language** and **test type** to focus on unique trends
- Access a client's previous assessment results, organized by **date** and **test type**

Bias Review

- Review assessment recordings to identify potential biases and evaluate client behaviour
- Review submitted responses alongside corresponding questions for accurate grading
- Utilizes MediaPipe and Deepgram to detect bias through keyword analysis and facial detection
- Incorporates clinician notes to document additional observations and insights

Usability Results

Two rounds of usability testing were conducted with clinicians and parents with children ages 8-12. After the second round, **5/5 Clinicians** and **5/5 Parents** agreed that:

- The system was easy to learn
- The marking interface was easy to use
- Navigating the interface was easy
- On-screen information was easy to read and understand
- The overall experience using the platform was enjoyable

Acknowledgements

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Future Work

- Incorporating motivational checkpoints to improve child engagement
- Introducing sequential test flow by adding a queued assessment system
- Adding the storytelling assessment type
- Improving bias detection accuracy

Dr. Irene Ye Yuan
McMaster University, Department of Computing and Software
A.N. Bourns Science Building, C529
Email: irene.yuan@mcmaster.ca
Phone: +1(905) 525-9140 Ext. 28656

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