# Problem Statement and Goals
# Software Engineering

Team #22, TeleHealth Insights
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Table 1: Revision History

| Date | Developer(s) | Change |
| --- | --- | --- |
| Sept 20 | Promish Kandel | Added Initial problem statement |
| Sept 22 | Promish Kandel | Modified Problem, Added Goals, Inputs/Outputs, Environment |
| ... | ... | ... |

# 1 Problem Statement

[You should check your problem statement with the problem statement checklist. —SS]

[You can change the section headings, as long as you include the required information. —SS]

## 1.1 Problem

Children with speech difficulties often require regular assessments to track their progress during speech therapy. These assessments are vital in monitoring development, identifying issues, and adjusting treatment plans accordingly. For bilingual children, these assessments can be challenging because of the shortage of bilingual speech language pathologists (SLPs). Parents, who are the key informants with understanding of multiple languages spoken in the home, have the potential to become helpers in bilingual assessments, especially in telehealth settings. However, existing bilingual language assessment tools are often designed and built based on SLPs's in-person practices, and lack designs specifically addressing parents' needs and behaviors when they act as e-helpers. The lack of

such design considerations could also affect the outcome from these assessments, when SLPs need to assess and understand children's results from remote assessments facilitated by parents. Hence, there are opportunities to build a system that better supports bilingual language assessment at home settings for children and parents, through providing better guidance and instructions for parents, capturing more contextual data to complement the results for SLPs, and engaging children in these assessments.

## 1.2 Inputs and Outputs

### 1.2.1 Input

- Video Stream of individual taking the assessment

- Selected answer via mouse click

- Microphone Audio

### 1.2.2 Output

- Audio analysis for background noise

- Video analysis for keyboard and face movement

- Analysis of the selected answers for all questions

[Characterize the problem in terms of "high level" inputs and outputs. Use abstraction so that you can avoid details. —SS]

## 1.3 Stakeholders

- Parents with children that have speech difficulties

- Childen with speech difficulties

- Clinicians who work with childern that have speech difficulties

- Research on the project, Dr. Yao Du, clinician assisstant professor at the University of Southern California

- Supervisor on the project, Dr. Irene Ye Yuan, assistant professor in the department of computing and software at McMaster University

## 1.4 Environment

### 1.4.1 Software

Software should be compatiable with Linux, MacOS and Windows operating system

### 1.4.2 Hardware

Hardware requried includes any personal computer with a speaker/headphones, webcam and microphone

# 2 Goals

- Data security to ensure health/sensitive records stored and communicated securely

    - The software should use an external server to store and reterive sensitive data from a protected database

- Intuitive and helpful interface that can guide parents to become successful e-helpers

    - The application should be easy to navigate with lost of signs. It should also provide feedback so that end users are aware of whats happening during the assessment.

- Engaging interface and interaction for children when taking the assessment

    - The webpage design should be simple but visually appealing with colors and pcitures where ever possible

- Provide reliable assessment results for SLPs by capturing additional contextual data and preliminary analysis

    - The application should provide additional information using audio and video analysis

# 3 Stretch Goals

# 4 Challenge Level and Extras

Approval of the extras will be part of the discussion with the instructor for approving the project. The extras, with the approval (or request) of the instructor, can be modified over the course of the term. —SS]

# Appendix — Reflection

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing "what you think the evaluator wants to hear."

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. What went well while writing this deliverable?

2. What pain points did you experience during this deliverable, and how did you resolve them?

3. How did you and your team adjust the scope of your goals to ensure they are suitable for a Capstone project (not overly ambitious but also of appropriate complexity for a senior design project)?