Problem Statement and Goals
ProgName

Team #, Team Name
Student 1 name
Student 2 name
Student 3 name
Student 4 name

Table 1: Revision History

Date	Developer(s)	Change
September 17th, 2025	Matthew	Added 1.1, 1.2 and References
Date2	Name(s)	Description of changes
...	...	...

1 Problem Statement

1.1 Problem

From the Global Burden of Diseases, Injuries and Risk Factors study performed in 2019, individuals that would benefit from physical rehabilitation at least once in their lifetime is upwards of 2.41 billion globally [Cieza et al., 2021]. Furthermore, a study indicating the perception of access to physiotherapy based on socio-demographic factors yielded that approximately 1 in 4 participants felt they had limited access to physiotherapy as a results of cost, wait-times or location [Bath et al., 2016]. Those with access to a physiotherapist experienced a disconnect with performing a movement with proper time-under-tension (TUT) and correct form [Faber et al., 2015]. While a physiotherapist can advise these individuals during assessment and proceeding follow-up appointments, the efficacy of rehabilitation depends heavily on the individual. In turn, this creates a need for a tool that helps users adjust exercise form unsupervised. This project aims to develop a tool that can provides feedback and correction during physical rehabilitation exercise.

1.2 Inputs and Outputs

Inputs: A recording of the user performing their physical rehabilitation exercise.
Outputs: Feedback or corrections of the demonstrated movement, along with adjustments to the form as needed.

1.3 Stakeholders

1.4 Environment

[Hardware and Software Environment —SS]

2 Goals

3 Stretch Goals

4 Extras

The extras chosen for the project are a **Design Thinking Document** and **User Instructional Video**.

The Design Thinking Document will explain how we approached our project from a higher level perspective.

The User Instructional Video will be a demonstration on the use of our application, to serve as a guide to new users and a demonstration to instructors alike.

[For CAS 741: State whether the project is a research project. This designation, with the approval (or request) of the instructor, can be modified over the course of the term. —SS]

[For SE Capstone: List your extras. Potential extras include usability testing, code walkthroughs, user documentation, formal proof, GenderMag personas, Design Thinking, etc. (The full list is on the course outline and in Lecture 02.) Normally the number of extras will be two. 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

[Not required for CAS 741 —SS]

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)?

References

B. Bath, M. Jakubowski, D. Mazzei, J. McRae, N. McVittie, S. Stewart, and S. L. Grona. Factors associated with reduced perceived access to physiotherapy services among people with low back disorders. *Physiotherapy Canada. Physiotherapie Canada*, 68(3):260–266, 2016. doi: 10.3138/ptc.2015-50.

A. Cieza, K. Causey, K. Kamenov, S. W. Hanson, S. Chatterji, and T. Vos. Global estimates of the need for rehabilitation based on the global burden of disease study 2019: a systematic analysis for the global burden of disease study 2019. *Lancet (London, England)*, 396(10267):2006–2017, 2021. doi: 10.1016/S0140-6736(20)32340-0.

M. Faber, M. H. Andersen, C. Sevel, K. Thorborg, T. Bandholm, and M. Rathleff. The majority are not performing home-exercises correctly two weeks after their initial instruction—an assessor-blinded study. *PeerJ*, 3:e1102, 2015. doi: 10.7717/peerj.1102.