

CSC431: Project Proposal

Roll Companion

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Preface

This is a proposal for the Roll Companion project for partial fulfillment of the requirements of a Software Engineering course (CSC431) project in the department of Computer Science at the University of Miami. This proposal provides the scope and context of the project to be undertaken. It details the intended user group and the value that the system will have to them. The intended audience of this document is the course professor and teaching assistants so that they can determine whether the project should be approved as proposed, approved with modifications, or not approved.

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1 Overview

1.1 Purpose, Scope, and Objectives

The purpose of Roll Companion is to provide Brazilian Jiu Jitsu practitioners with tools that accelerate their rate of progression and technical proficiency beyond training on the mats. The app enables people of all skill levels to gain a greater understanding of the sport, however novices will gain the most from its use due to the high skill ceiling. Roll Companion will be a cross-platform mobile application.

1.2 Project Description

1.2.1 Problem Statement

Brazilian Jiu Jitsu is a challenging sport consisting of a variety of skills, often considered the most difficult martial art to learn. The vast amount of techniques can overwhelm beginners and even more experienced practitioners that are beginning to put together their specialized game. The term "game" in Brazilian Jiu Jitsu refers to the tactical and personalized assembly of techniques that make up the fighter's style. Roll Companion will ease the process for practitioners by providing a method of tracking training progress and working towards goals. Additionally, it will illustrate beginners a macro view of the sport and experienced fighters insight on how to further develop their game.

1.2.2 Services and features

Use of the application will require sign up and/or login. Upon sign up there will be a questionnaire to determine the skill level and preference for different techniques. The main screen will display a graph representative of the positions, which will subdivide into the submissions, escapes and transitions possible within them. Users will be able to update skill levels and preferences. The graph will morph according to the proficiency or tendency towards specific techniques. Areas of greater proficiency will be represented by larger nodes and edges. The graph will display a personalized overarching view of what techniques are more developed and the ones that are not. We will make use of graph neural networks in order for the graph to represent and learn the relationships between the different positional techniques. We will implement the GNN ourselves. A rank will be given to each user reflecting their skill level, which will be computed by an algorithm according to the skills and proficiency the user indicated. Users will be able to "befriend" each other

and compare ranks. Additionally, the application will have a library of the techniques with videos of their demonstration. We would hire a production team to film the videos and store them in our database.