AI Ski/Snowboard Coach PRD-for Wechat Mini-program

Version	Date	Editor	Summary of versions
V1.0.0	2025-03-05	Elaine	AI Coach MVP PRD
V1.1.0	2025-04-20	Elaine	AI Coach Mini-program

1.Introduction

Skiing and snowboarding require precision, balance, and technique, yet many struggle to improve due to limited access to quality coaching and high price. AI Skiing Coach bridges this gap by leveraging Computer Vision, Machine Learning (ML), and AI-driven analysis to assess user-uploaded videos and provide real-time, expert-level feedback.

With advanced motion tracking and tailored training suggestions, this AI-powered personal coach helps skiers and snowboarders refine their skills anytime, anywhere, making progress more efficient, accessible, and intelligent.

1.2 Business scenarios and commercial value

The skiing and snowboarding market is experiencing significant growth, with an estimated 35 million skiers and snowboarders globally in 2024. Based on industry trends, 15-25% of these individuals choose professional coaching. Between 4.95 million and 8.25 million skiers are likely to choose ski coaching services with estimated coaching market size is between $2.48 billion and $4.13 billion.

Scenario	Commercial value
Basic AI coach (Text-based feedback) Potential user base: 2-5 million	Offers AI-driven movement analysis, allowing users to upload videos and receive text-based technique suggestions.
Personalized Skier Services (Video-Based Recommendations) Potential user base: 1.5-3 million	Provides 1v1 professional coaching, AI-analyzed video feedback, and customized training plans.
Coaching Services Potential market value: 6 -12 million	Facilitates coach certification, on-site evaluations, user ratings, and platform bookings.
Premium Subscription (membership model/buyout model) Estimated paid users: 500k-1.5million, $150-500 million revenue	Unlocks all AI analysis, priority coach feedback, and exclusive learning resources for subscribed users.

2.Product Overview

2.1 Terms definition

Type	Terms	Definition
Snow board	Edge Transitions	The movement of shifting weight between the front and back edges of the snowboard.
	Center of Gravity	The balance point of the rider that affects stability and control.

	Body Coordination	The movement of the upper and lower body for effective turns and stability， including shoulder rotation, arms, legs, eye sight.
	Snowboard Edge Transitions	A complete transition between front and back edges during a turn.
	Full Turn	One completed turn consisting of both front edge and back edge engagement...../../definition.mp4
	J-Turn	A beginner technique to initiate a turn using a gentle curve, forming a "J" shape.
	C-Turn	A smoother, more controlled turn forming a "C" shape, used for gradual direction changes.
Ski	Parallel Turn	A technique where both skis remain parallel throughout the turn for better speed control and efficiency.
	Pizza Turn	A wedge-shaped stance used by beginners to slow down and turn by pressing the ski tips together.
	CASI	The official certification body for snowboard instructors in
	CISA	A certification standard for ski instructors in Canada, ensuring structured training methodologies.

2.2 Target users

• Self-Learning Beginners: Skiers and snowboarders who primarily rely on self-practice and want real-time feedback to improve their skills.

• Online Ski Instructors: Coaches who want to earn money by providing remote feedback and personalized guidance.

2.3 Needs Objective

Objective 1: Provide real-time AI-driven analysis of uploaded skiing and snowboarding videos, focusing on posture, balance, edge control, and technique execution. Key detection metrics include **edge transitions, center of gravity, body coordination**, specifically in **snowboard edge transitions** and **ski parallel and pizza turns**.

Objective 2: Comparing user's video with standard technique videos (CASI/CISA) and generate customized AI improvement suggestions to correct mistakes and enhance performance.

Objective 3: Provide progress tracking and learning paths, allowing users to review past consultation records and revisit historical feedback and recommendations.

2.4 Solution

The AI Skiing Coach leverages computer vision and machine learning to analyze user-uploaded skiing and snowboarding videos, providing real-time feedback for skill improvement.

Key Features:
• Pose Estimation and Motion Tracking: Detects body posture, joint angles, and movement patterns.
• Performance Analysis: Compares user movements with professional techniques.

• AI-Generated Feedback: Provides real-time actionable improvement suggestions.
• Progress Tracking: Allows users to monitor and review past feedback.

2.5 Competitive Analysis

Competitor	Key features	Screenshots	Key takeaways
Carv (https://getcarv.com/)	Smart ski clip with real-time motion tracking, edge control analysis, and AI coaching via Bluetooth		Ski only, precise muscle detection, great for real-time feedback. With standardized scoring, limited and repeat suggestions, it is too complicated for beginners to understand and self-learn

2.6 MVP Core Features
• User Account Management: Registration, login, and profile setup.
• Video Upload: Users can upload skiing/snowboarding videos.
• AI Analysis and Evaluation: Detect motion and analyse errors
• AI-Powered Feedback Generation: Provide textual feedback.
• Consultation Records: Store and display user's past analysis and feedback, dates and notes can be revised.
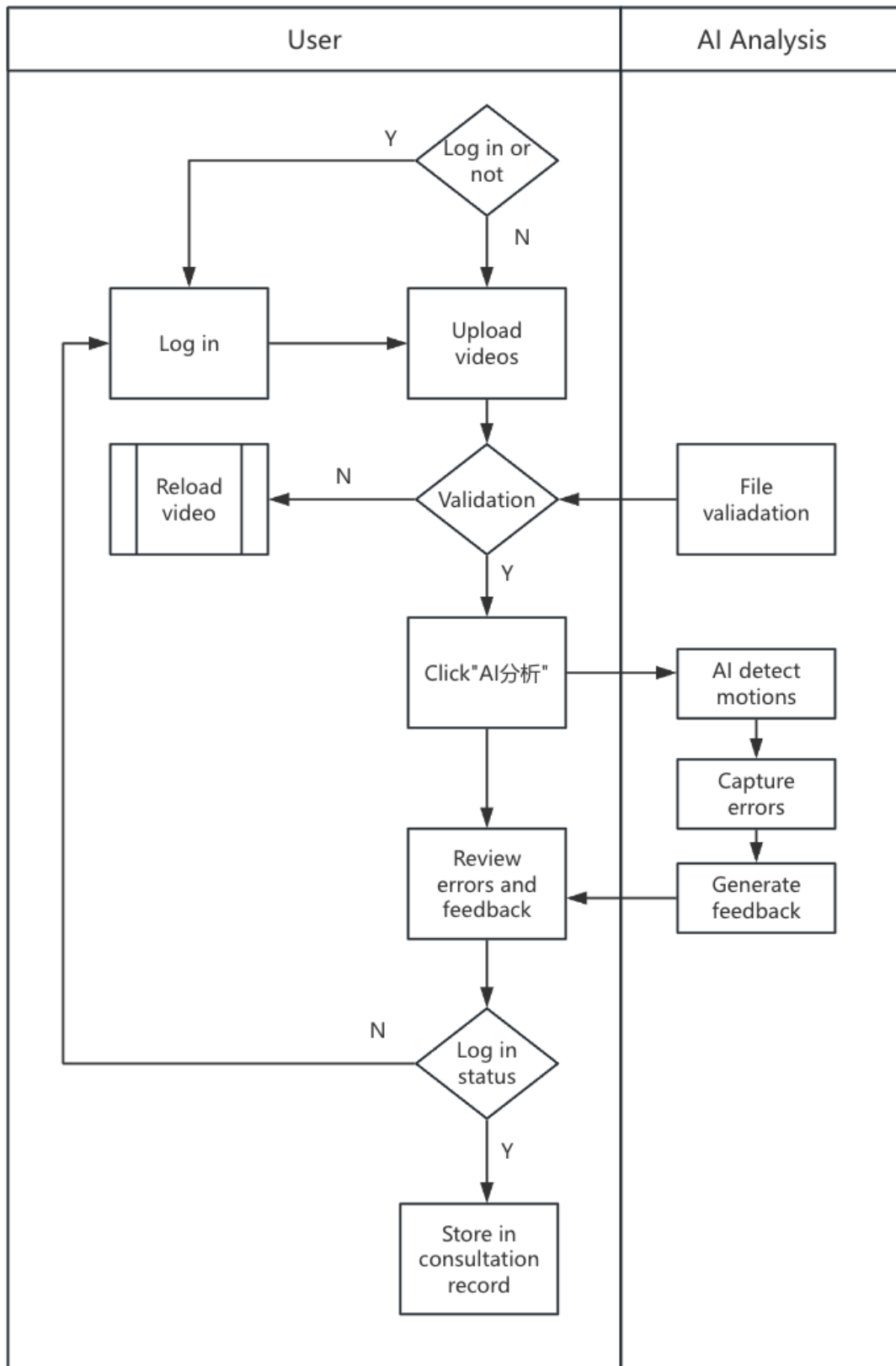
2.7 Future Features
• Extend AI analysis to cover more advanced skiing and snowboarding techniques, including carving, moguls, jumps, and freestyle tricks.
• Implement a structured scoring system to evaluate skiing fluidity, symmetry, and precision.
• Introduce an achievement system, allowing users to track progress, unlock milestones, and earn rewards based on skill improvements.
• Personalized Learning Recommendations: Match detected errors with standard techniques and suggest relevant training videos.
• Coaching Services: Enable professional instructors to provide personalized feedback.
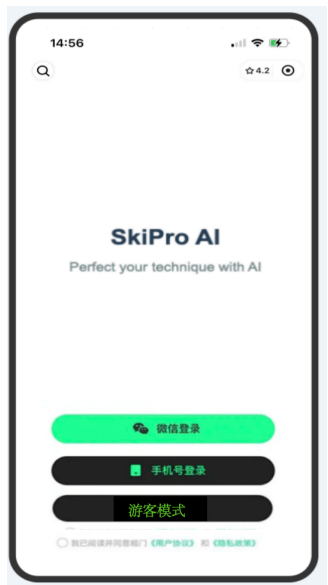• Membership/ buyout payment setup.

3.Requirement instruction
3.1 Requirement list

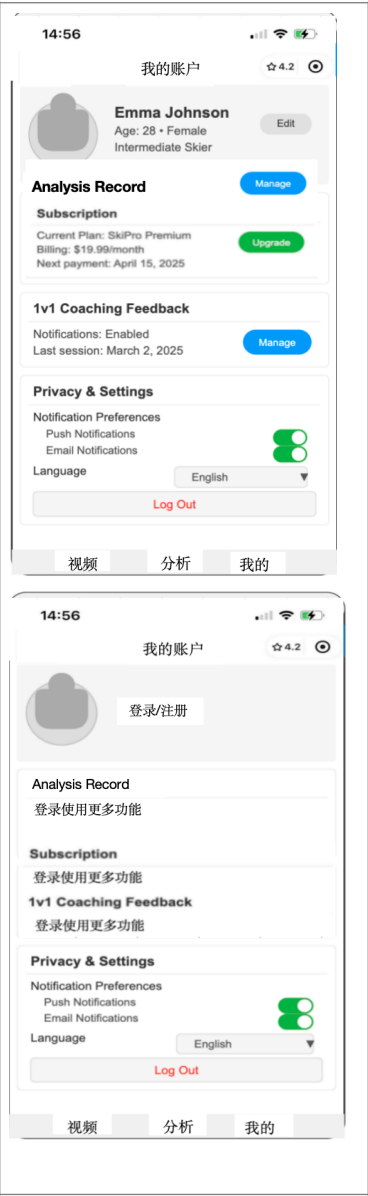| ID	Requirement	Objective	iteration	priority
1.1	User account management	Sign in/ log in	April(1.0)	P0
1.2	User profile	Manage user account and personal details.	April1.0)	P1
1.3	Video upload and validation	Support video upload and check video quality	April(1.0)	P0
1.4	AI Analysis and Evaluation	Detect motion and capture errors	April(1.0)	P0
1.5	AI-Powered Feedback Generation	Provide textual feedback	April1.0)	P0
1.6	Consultation Records	Store user's past analysis	April(1.0)	P1

3.1.1.User Account Management

Module	Requirement instruction	Pattern

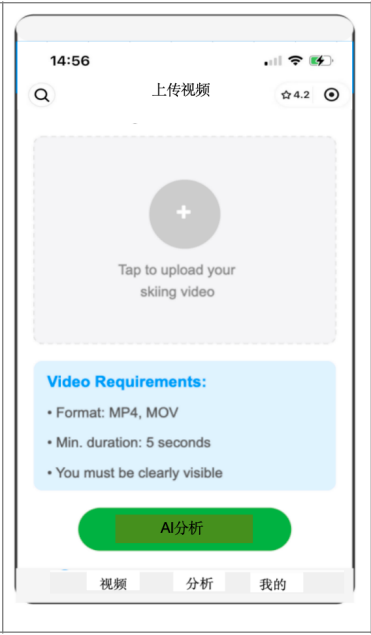| User account	• Users can logj in via wechat user automatic loading with authorizing. • If users choose to log in with account, he/she can log in via phone number. • After entering the number, they will receive a verification code to complete login. • Upon first login, users can set a password and enable session persistence for seamless access.	

3.1.2.User profile

Module	Requirement instruction	Pattern

User profile	• In log in status: • Users can manage the personal Information, name, age, gender, and profile photo. • Users can manage or view the previous analysis record. • Manage subscription and membership by showing current plan, billing info and upgrade options. • Manage 1v1 coaching feedback notifications. • Privacy and setting. User can manage notification preferences and language and log out.	

3.1.3.Video upload and validation

Module	Requirement instruction	Pattern

| Video upload and validation | • Users can upload skiing videos from their device.
• Validate file format (MP4, MOV), resolution, and duration.
• If the video does not meet AI analysis requirements, the system will prompt users with messages: "Please select a video longer than 5 seconds," "Please upload a clearer video," or "Please choose a video where you appear most prominently in the frame".
• List a clear requirement of the video(size, length of the video, video type, color of costume, the proportion of main person).
monitor the time | |

3.1.4.AI Analysis and Evaluation

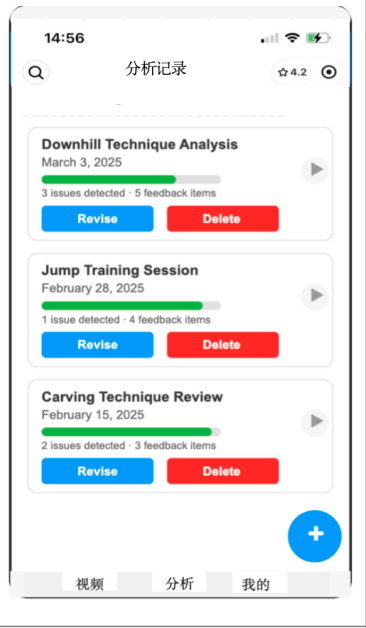| Module	Requirement instruction	Pattern
AI Analysis and Evaluation	• Detects motion patterns, edge transitions, center of gravity shifts, shoulder rotation, and arm/leg coordination in the uploaded skiing video. • Identifies errors by comparing movements to standard skiing techniques (CASI/CISA) and captures key frames for visualization. • Extracts key frames where errors occur and categorizes them. Errors in each classification is displayed in chronological order. Each full turn (front edge + back edge) is counted as one instance for classification. • Users can filter issues by selecting "All" or specific tags ("换刃", "重心", "身体协调"). Clicking on a snapshot will jump to the corresponding timestamp in the video. User can play it.	

3.1.5.AI-Powered Feedback Generation

Module	Requirement instruction	Pattern

| AI-powered Feedback Generation | • Each detected error is paired with a , actionable suggestion abbreviation, listed at the right side. Left size is a random picture from that kind of error.

• User can click "查看全部" to see the overall captures of each type of errors (pictures), paired with suggestions.

• User can click "保存" to save this record. The record will be listed in consultation record. If users doesn't log in, he/she will be tuned to the log in page.

• Users can rate the suggestion and give textual feedback after clicking "save feedback" or on the right side corner.

• If no significant errors are detected, users will receive prompts: "No major errors detected, try uploading another video for deeper analysis".

• In "详情"page:
• Related video suggestions or 1v1 coaching suggestions will be listed in "view detail".

• A summary of error, improvement suggestions, details of all detected errors with captures from the video, and 1v1 coach suggestions will be presented in this page.

• Some details including time, specific tags will be listed in the "error captures" | |

3.1.6.Consultation Record

Module	Requirement instruction	Pattern

Consultation record	• Store and manage users' past AI analysis results, including date, video analysis history, error snapshot, detected issues, generated feedback. • User can revise the name, date of video, ski resort. • Retains records for up to 2 years.	

3.2. Tracking points

Tracking Name	Explanation	Parameters
Video Upload	Collecting video, monitors video upload time and failure reasons	Video ID, upload time, video size, failure error codes
AI analysis	Analysis time and success rate, common suggestions, issue frequency	Video ID, analysis duration, analysis success rate, issue frequency
User feedback	Collects user satisfaction with AI suggestions	Rating, text feedback, user ID

4.1 Project Schedule

Milestone	Timeline	Note
MVP for web	TBD	
MVP for wechat mini program	TBD	
MVP for IOS	TBD	
Promotion	TBD	