Marissa Villano
Dr. G
INFO 693-900
21 April 20

Project Proposal: B(AI)LAR,
AI Dance Skill Level Assessor

Introduction

Present day, dance studios commonly require new and advancing students to complete a dance evaluation prior to enrolling in a class. As a result, students must take the initiative to coordinate an evaluation with the studio and physically go to the studio to complete it before they can enroll in and attend the desired class. While dance evaluations help appropriately align students to classes based on their current skill levels, the manual steps inconvenience the student and might result in business fallout, studio policy violations, and or poor customer experience. This project aims to explore a design opportunity for dance studios to incorporate Artificial Intelligence (AI) for dance skill assessments and introduce more self-service to their class enrollment process online.

Background

The understanding of this problem space is based on empirical evidence with certain Latin dance studios in Chicago, Illinois, but findings apply to any dance studio with a similar business model and studio policies.

For dance studios and instructors, catering lessons to the skill level of the students plays a critical role in their effectiveness, value, and customer satisfaction. As a result, dance classes are commonly offered by skill level to strategically provide appropriate lessons for students of varying experience. Each dance studio defines their respective set of requirements of students as a basis of techniques needed to succeed at the skill level of the class. Instructors utilize their studio-defined checklist of expected dance capabilities to assess new or advancing students and ensure their class enrollment aligns to their skill level. This process typically requires students to coordinate and go to the studio to complete before they can start taking classes. Evaluations are normally twenty minutes or less and students are asked to demonstrate specific skills on demand. In an effort to help students gauge their skill level without the evaluation, many dance studios outline what general skills are expected at each level and or correlate the amount of time dancing to levels.

Three different business models have been observed for dance studio class offerings. In all three, schedules are built in 4-week blocks, called sessions, and classes occur once a week per session. The first business model can be described as a drop-in model where the classes offered

at the studio each focus on a skillset to practice. Students can take multiple classes per session (within their skill level) and thus learn whichever desired skills at once. When the student has the minimum required skills for the evaluation criteria to advance, they can sign up for the evaluation. If they pass the evaluation, then they unlock the classes at the next skill level. If they fail the evaluation, they can continue to select from a variety of classes at their current skill level. There are only two evaluations (intermediate and advanced) per rhythm, so students will only ever have to be evaluated twice throughout their whole journey at that studio. In this model, students have more agency in deciding what they do or do not want to pay money to learn but need to be intentional about the classes they select if their goal is to advance skill levels.

The second business model can be described as a curriculum-based model where each class is a skill level with a specific skill to be mastered. Students must take the classes sequentially as advanced classes will refer back to previous skills or patterns learned. In this model, every student in each class has the same skillsets because they had to learn the same curriculum to advance. Since students can only take classes at their level or below each session, they are capped at the amount of new skills they can learn per session. Evaluations occur after the completion of each session. If a student passes their evaluation, they can take the next class in sequence or repeat anything below their skill level that they already learned. If a student fails the evaluation, they cannot move forward and must repeat a class.

The third business model can be described as a rotating-model where each class is a skill level, but the skill focus per session rotates. The studio might suggest timelines for how long to stay at each skill level, but there is no required evaluation to enroll, so students can enroll based on self-confidence, experience, and desire. In this model, students have more agency to take varying levels of classes but are unable to anticipate which skill focus will be offered per session until it is time to enroll.

The variation of business models and class offerings by the different dance studios makes it difficult for students to assess the transferability of their skill level at one studio to another. For example, consider a student that only ever took classes at the drop-in studio but never took one of the beginner classes, say Dominican-style bachata footwork, because it was not required for the intermediate evaluation. That student could still pass the evaluation and be considered intermediate and able to take more advanced topics and expand their dance knowledge. If that student wanted to start taking classes at the curriculum studio, they would need to be assessed to see where they fit in accordance to that studio's skill level definitions. If the curriculum studio defines Dominican-style bachata footwork as a beginner-level skill, then the student would fail the evaluation because they never learned that one specific skill. As a result, they have to start at a beginner level class where that skill is taught and then move progressively back up to intermediate. It is possible the student could ask to be re-evaluated after that session to skip levels if that truly was the one skill missing. The take-away, however, is that skill level becomes subjective based on the studio's definitions and thus supporting the need for evaluations to properly place students in the right classes.

Since evaluations are beneficial on many fronts, the design solution will not focus on removing it from the enrollment process but exploring how AI might enhance the required evaluation process. Dance studios might benefit from AI proctoring the evaluations so that the instructors can use their time on other important matters. Students might benefit from AI proctoring the evaluations by allowing them scheduling flexibility, time and effort save from commuting, and a more streamlined enrollment process.

Requirements

The solution must meet the following functional requirements:

- Embeddable
- Always available
- Accessible via mobile or web devices
- Display camera feed
- Overlay of user instructions
- Make record of skills demonstrated
- Run logic of evaluation record against evaluation criteria
- Store evaluation record
- Display summary of skills demonstrated
- Display recommended class
- Display skills library content

The solution must also meet the following nonfunctional requirements:

- Intuitive process flow
- Recognize niche movements
- Request permission to access camera
- Customizable evaluation criteria
- Scalable libraries
- Protect user data
- Many users can use at any one time
- Set clear expectations of evaluation criteria

Prospective Methods

This project will explore the creation of B(AI)LAR, an AI dance skill level assessor, that dance studios and students can leverage in satisfying the dance evaluation requirement. Once embedded into the existing dance studio site, B(AI)LAR will create a fully self-service enrollment process by allowing students to execute their evaluation from wherever by dancing in front of their webcam. As the student moves, it can classify body positions as specific dance skills and make a record of what the student presented. This record will be vetted against the evaluation criteria set by the dance studio and make a recommendation on which class the student should enroll in based on the skills demonstrated.

To start, B(AI)LAR will come equipped with ChaChaChAI, BachatAI, and SalsAI, the preset libraries with commonly evaluated dance moves for the respective rhythms. The prototype will be created using Google's Teachable Machine service. Dance evaluation criteria for each rhythm will be collected from various dance studio websites to identify the expected dance moves in each library. By using reference files and or striking poses in a webcam for each dance rhythm, the AI model will be trained to classify body positions as the specified dance move.