Kinect Ballroom Dance: Dynamic Practice of Ballroom Technique

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KINECT

Problem

Ballroom dancing essentially requires the dancer to have a partner or teacher to show them what they are doing wrong and how to fix it, making it very *difficult for the dancer to practice moves if they are by themselves* (i.e. at home). This can be an issue if the user does not know many ballroom dancers, cannot attend classes for whatever reason, or simply wants more practice on their own.

Target User

Our target users are **beginner amateur competitive ballroom dancers**. They are more likely to use the Kinect application than social dancers because competitive dancers focus more on *improving the look of their dancing* and less on learning many dance moves/figures.

At the amateur level, dance moves/figures are more standardized and improvement at that level would require working on movements that the Kinect application can pick up or are not difficult to implement. The feedback is more standardized because of the concrete syllabus of dance moves/figures and mistakes are more visible.

Solution

Our solution is to create a Kinect application that allows people to get a similar kind of feedback as they would normally get from a dance instructor/partner, allowing them to practice their dance moves and learn new ones by themselves.

KINECT BALLROOM DANCE gives feedback to ballroom dancers while they are practicing, with a focus on **ballroom technique**.
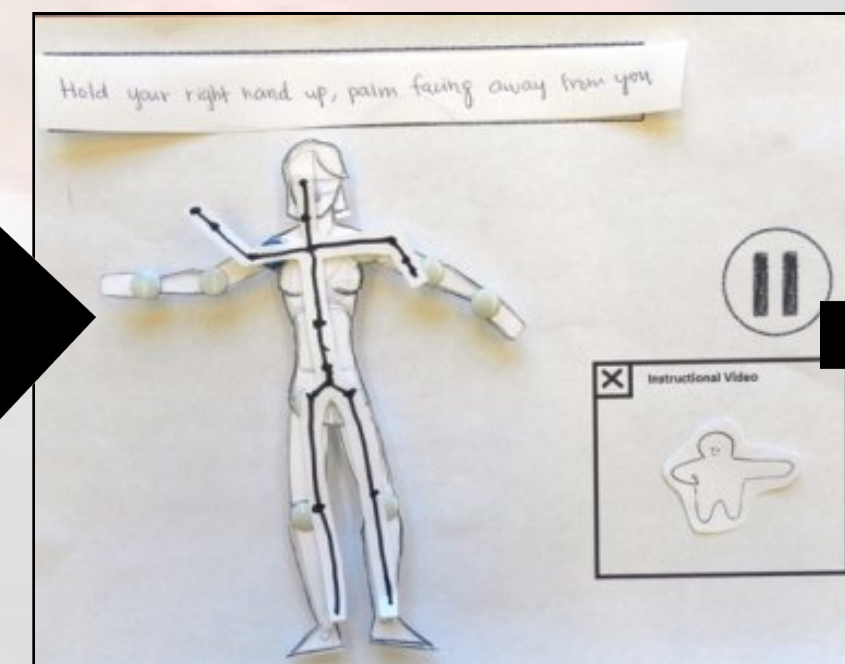
Specifically, the goal of our application is to provide dancers with **FEEDBACK** while they

- Learn and practice *dance posture*
- Learn and practice *dance figures*
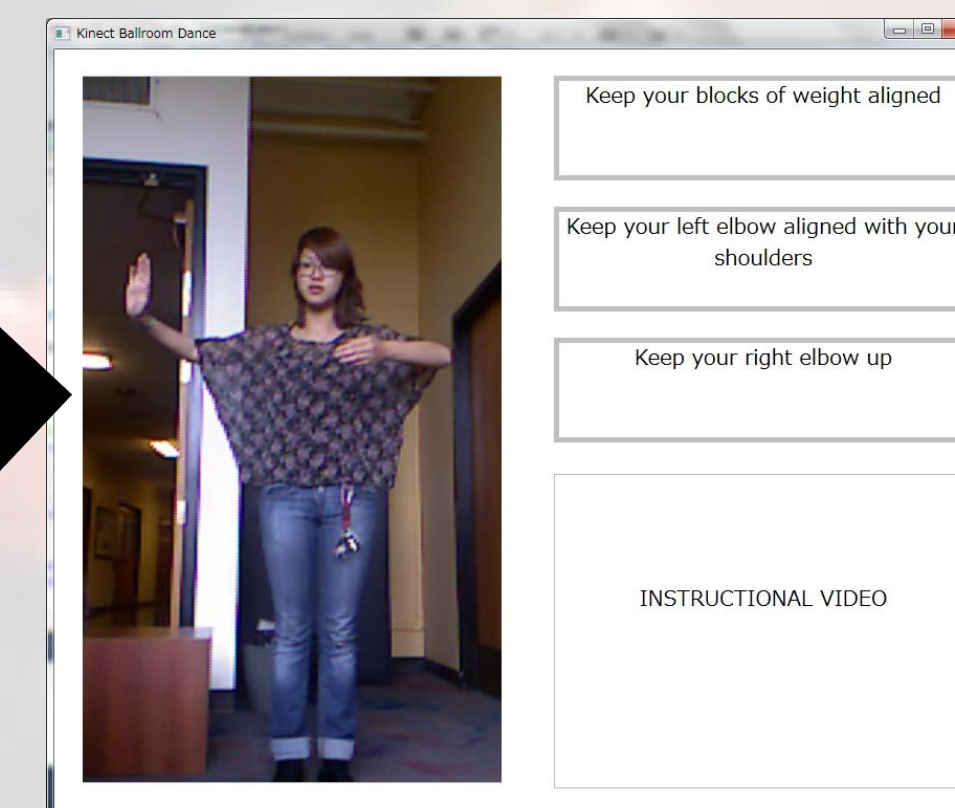- Learn and practice *dance sequences*

Design Evolution
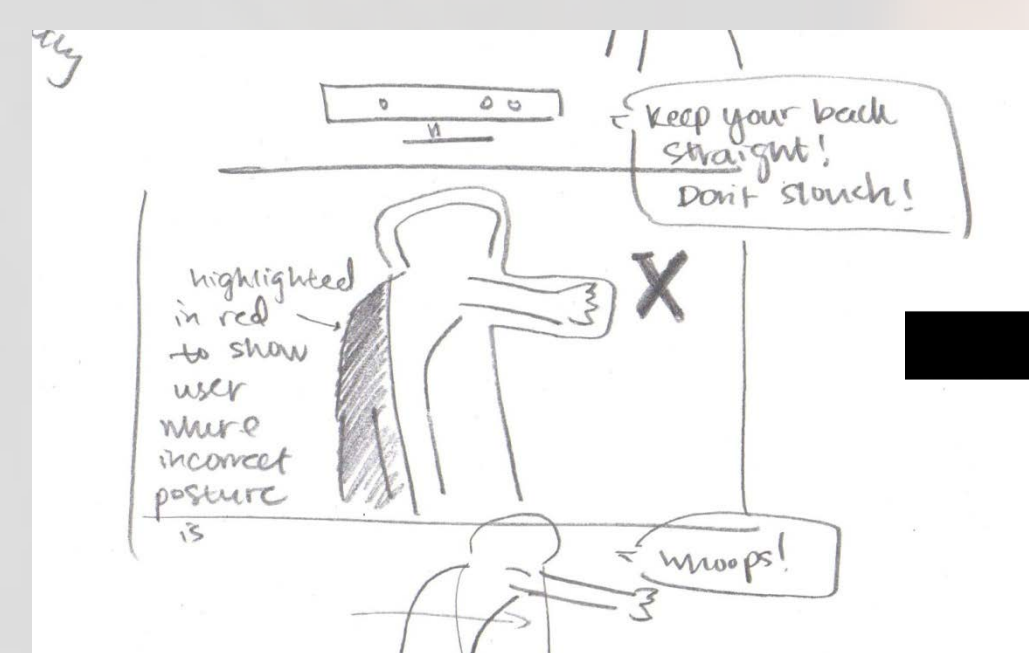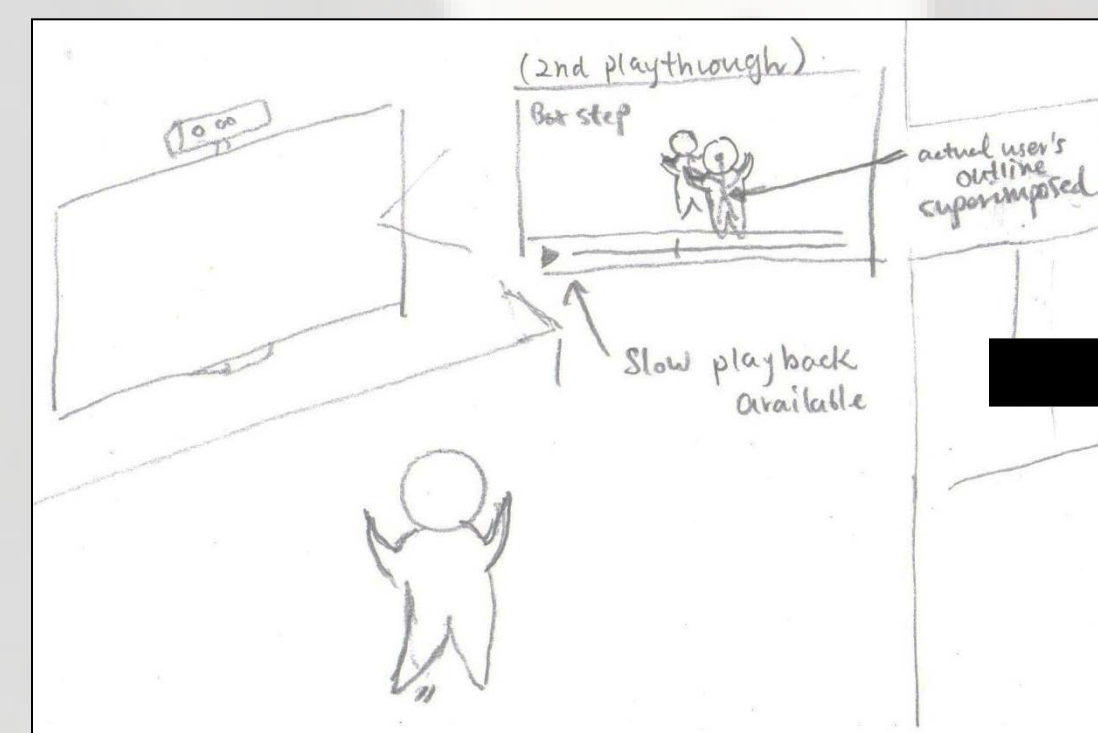

Interface Design: Scenario Storyboarding
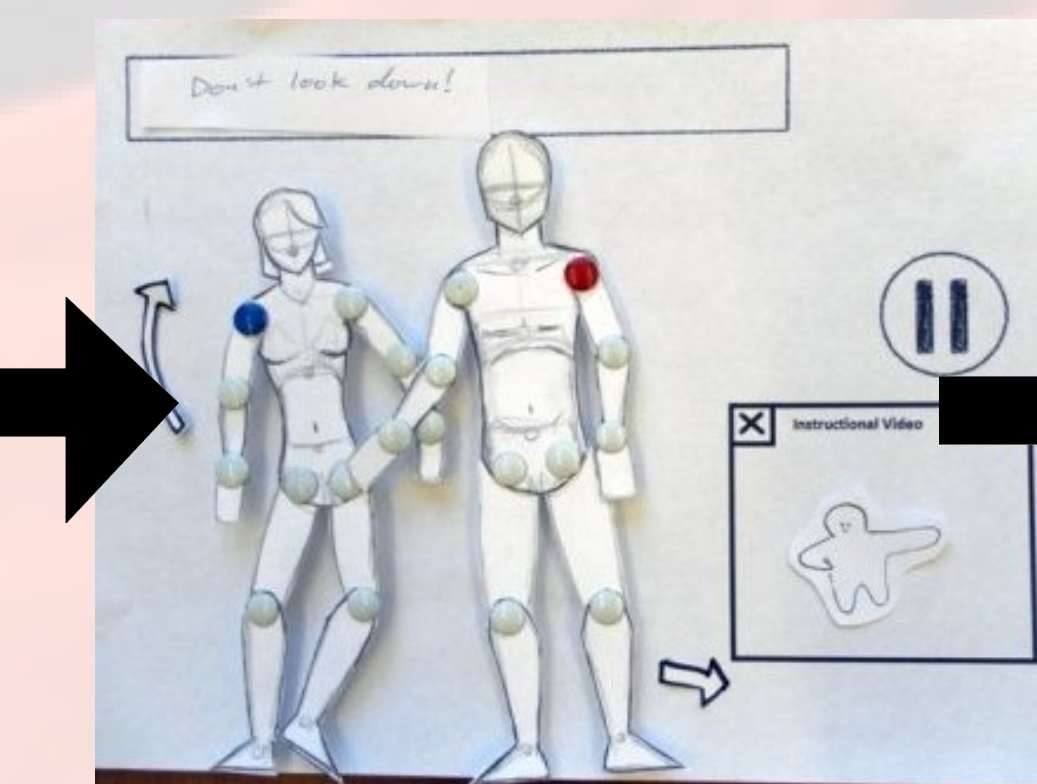
Low-fidelity paper prototype and testing

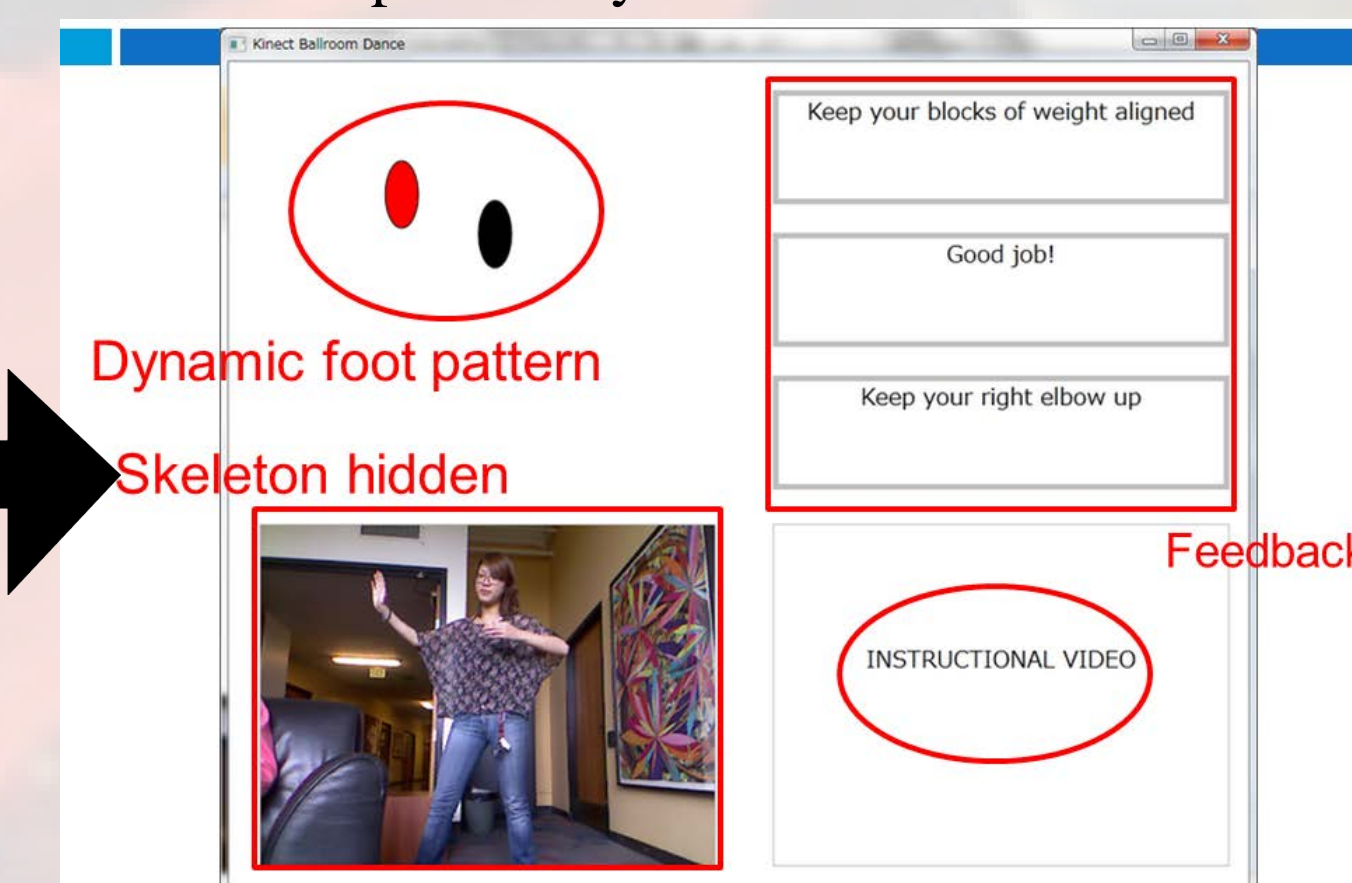Interactive prototype and pilot study

Our **POSTURE LESSON SCREEN** started with an outline intended for the user to stand within. It then evolved to a skeleton overlaid on the user's color feed. Both of these plans however, were not good at indicating to the user what they ought to be doing in the z direction, or in terms of depth. We decided to scratch any overlays and instead added **textual feedback** that the user could look to for feedback. We also added an **instructional video** for the user to follow.


Interface Design: Scenario Storyboarding

Low-fidelity paper prototype and testing

Dynamic foot pattern
Skeleton hidden
Feedback

Interactive prototype and pilot study

In our **DANCE LESSON SCREEN**, we first intended to have a skeleton which would perform the correct intended dance moves that the user could follow. We soon realized this would be incredibly difficult for a user to follow, and decided instead on displaying arrows over the user's color feed. We ran into the problem once again of the z direction and came up with the solution of displaying the arrows on a **top-down view of the user's feet**. The users now move their feet according to arrows that appear.

Final Prototype

CHA-CHA

BACK

Closed Basic | New Yorker
Underarm Turn | Spot Turn
Cha-Cha Sequence
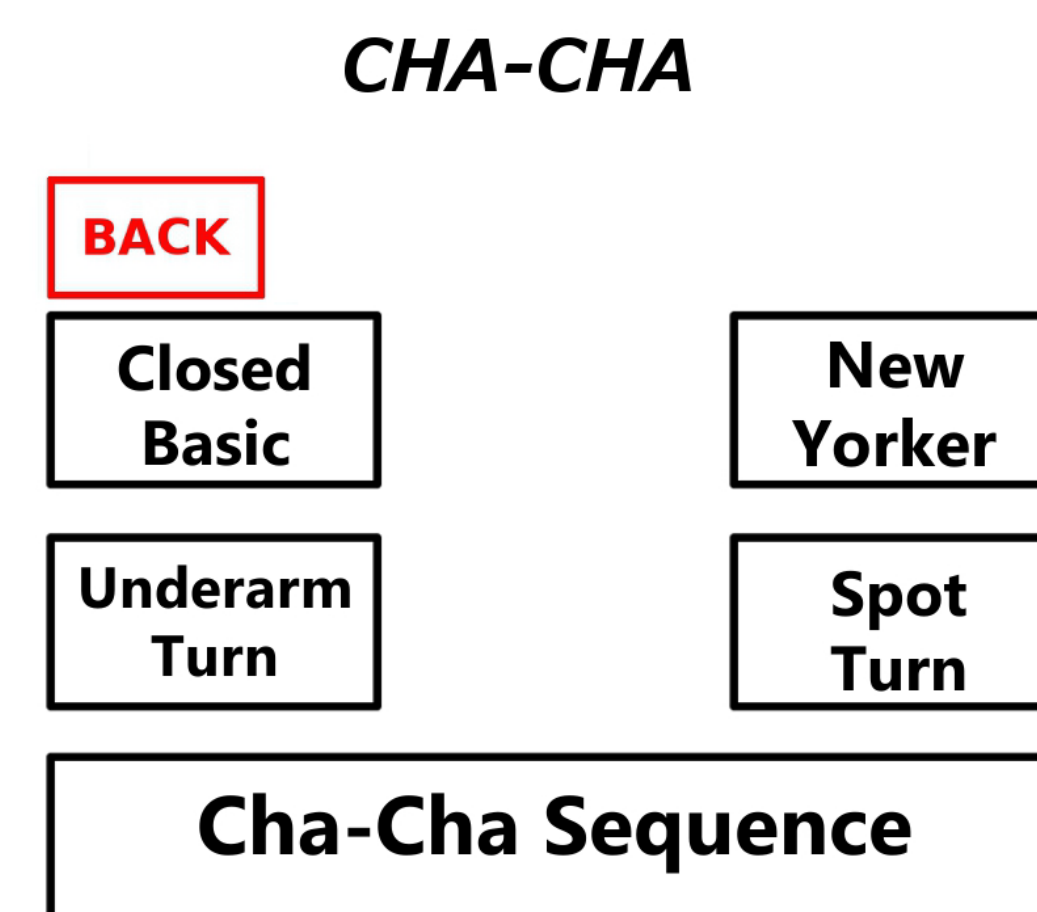
MENU: Users navigate the menu by moving their *right hand to change which option is highlighted and raising their left hand to select the highlighted option*. We originally had a back gesture but users were having difficulty with it as it was too similar to our gesture for selection. We have also expanded our menu to include new content. In the future, we would like to beautify our menu so that it is more visually appealing.

POSITIONS/POSTURE: Our posture screen includes a *large color feed* of the user to act as a mirror to see themselves. The posture screen also has an *instructional video* and *textual feedbac*k telling the user how they are doing. The user may practice posture as long as they wish and when they are done they may raise both hands above their head to pause or quit. In the future, we would like to implement more visual feedback for posture aside from text, for example highlighting the area of the body which is not in the correct position.
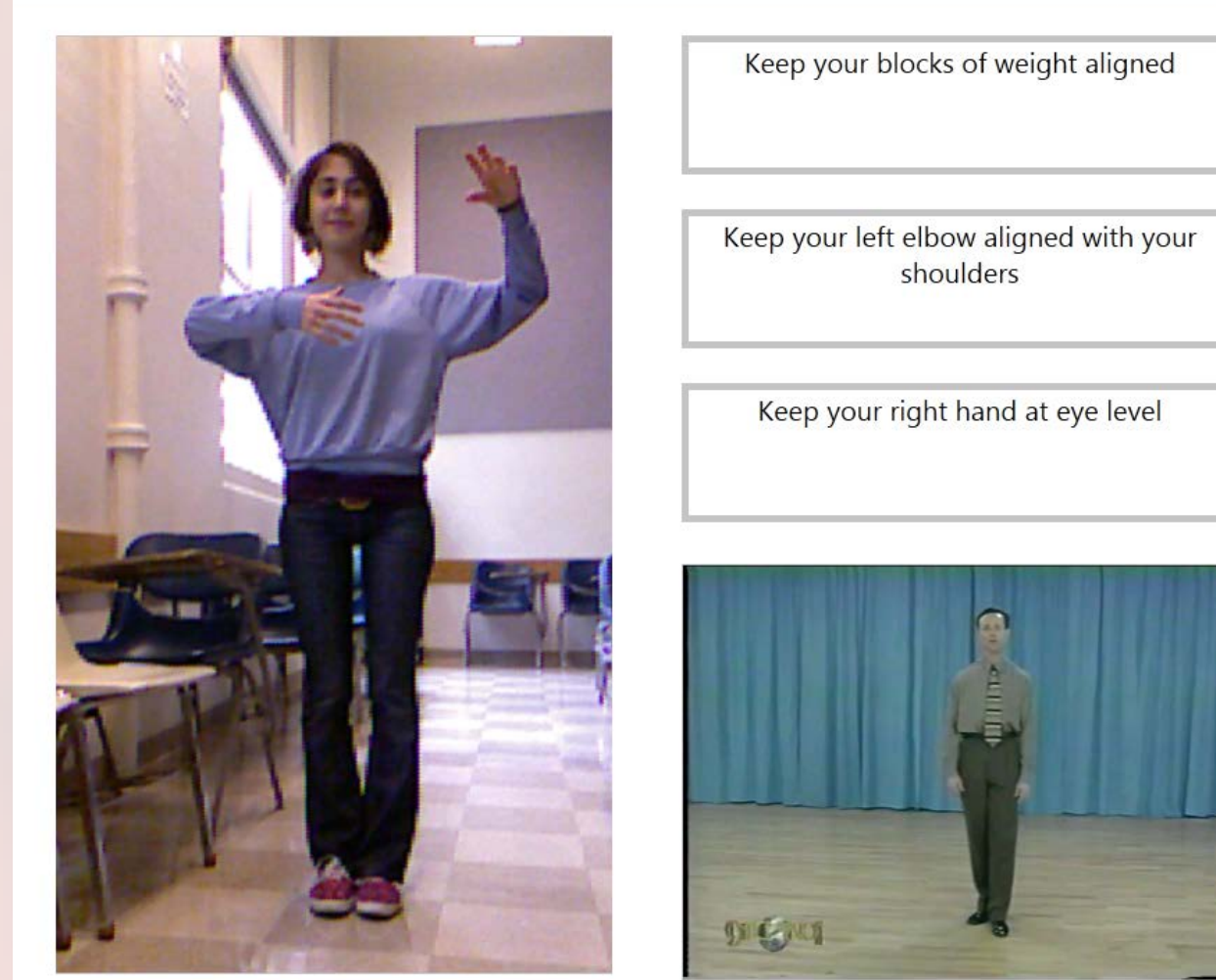
DANCE FIGURES AND SEQUENCES: Our dance lesson screen has a *color feed of the user, an instructional video, textual feedback, and a top-down view of the user's feet*. In the feet view, *arrows appear* next to the user's feet indicating the direction in which that foot ought to be moved. The feet also change colors. A *color change* indicates that a certain action must be performed by the user with that foot in place. A *red* foot tells the user that the user must switch their weight onto that foot, *purple* feet mean to split weight between both feet, and a *yellow* foot means to turn on that foot in the indicated direction. In the future, we would like to increase the robustness of our foot view in order to deal with more erratic user behavior. Right now our application assumes that the user generally understands the directions and does their best to follow the arrows. We would also like to include a check that the user is standing the correct distance from the Kinect before we begin the lesson.