**Overarching Goal:**

Use case: single person doing yoga

Problem to solve:

1. Be able to compare poses: comparison to self, comparison to instructor
   1. Creating a distance measure
   2. Classifying into clusters
   3. Regression?

Measuring distance between two poses

* One base pose which could either the ideal “instructor” pose (which measure how well someone is doing) or the previous session’s pose (which measures progress -- maybe towards a goal?)

(Jay, Problem Statement)

Why do we care about this?

* Improving people’s health at home
  + Helping beginners learn and practice at home
  + Helping experts remotely train/teach beginners
  + Helping individuals set fitness/yoga goals and follow their progress
* Turning human poses into numerical data/metric

**Steps:**

1. Building the skeletal representation of poses
   1. Converting pictures to 3D representations
      1. How necessary is the 3rd dimension
      2. Time?
   2. One camera vs two/ depth issue
      1. Time?
      2. Metric of success - at what point do we switch to 2 camera
   3. Evaluation: How well does it classify poses?
      1. How are we determining distance metrics?
         1. How necessary is this metric?

**What are we doing?**

* Figuring out deviation from ideal
* Classification

**Data:**

Pilot: MPII Human Pose Dataset (human-pose.mpi-inf.mpg.de)

* To determine appropriate methodology
  + Neural net or not
  + If neural net, which neural net
  + If not neural net, what are other options

Case: Youtube videos of people doing yoga (maybe?), real person?

**Data collection:**

Scraping youtube

Generating simulations using an avatar

OLD RESEARCH PURPOSE

1. Build a deep learning neural net model of a single human which can map posture and gait.

2. What is the best method for combining incoming video streams from multiple cameras? How will the neural net account for differences in angles and depth?

3. Which distance metric should be used to compare skeletal positions?

4. How do we best model injury risk situations based on skeletal positions?

Deleted from Assignment 2

While our first major milestone (and possibly the final milestone, with respect to the capstone) is to extract joint angles, we will need to convert raw images or videos to these joint angles.