* Project title (make this the title of the post too)
* Key project image
* Names of the group of members if more than one (important!)
* Project description (250 words max) - describes your collection of studies

My series of studies focus on simulating nature power through computer graphic algorithms by using PoseNet and Clmtrackr, which are introduced in class. With these API for P5.js, I am able to use a webcam to track my body and face turning them into controllers. By moving the hands, head, or mouth, viewers can affect the particles' movement and trigger an event in my study. Augmented Reality is a popular research and marketing topic recently; my project attempts to explore the possibility of interaction with the virtual elements while applying the physical space and how our body is engaged in the interconnection. Direct and metaphoric control are the two main methods; one can trigger an even directly by doing a certain action, while the other can affect the track of the elements predefine by the algorithm. Daniel Shiffman's tutorials on the particle movement algorithm provided the fundamental of my work; all the graphic generating on my works is based on his tutorials. As my professors, Kate Hartman and Nicholas Puckett, provide amazing tutorials on body Tracking to trigger events and draw shapes with the Face Tracking API.

* For each study:
  + "Present" Link for Code (under File -> Share in the web editor)
  + "Edit" Link for Code (under File -> Share in the web editor)
  + gif or video of the interaction with sketch and video feed side-by-side
  + Screenshot from video - key moment in interaction
  + Brief description of study including observations and reflections about the interactive experience (100 words)

1. This sketch attempts to immerse the viewers to a dark night influence by Van Gogh and observe and interact with the star's movement on the screen. The viewers should raise one of their hands in front of their webcam, move the hand slowly to observe how it affects the stars' movement. The algorithm of the direction of the stars is based on the Perlin Noise, which Shiffman introduces. By modifying the noise wave with the hand position, the star's track will follow the position of the viewers' hand.

2. The sketch positions the viewers into a universe space and turns their head into a black hole to attract the photons on the dark space. By moving their head on the space, the viewers can see how the photons follow it. Such moving can create a real-time interactive animation to simulate how a black hole work in the universe. This work follows the tutorial of 2D Black Hole Visualization from Shiffman to create the black hole's attraction algorithm. To make the black hole follow the people's head, I get the nose's keypoint and attach the holo on it.

3. This sketch provides the fish experiment to the viewers. By applying a dark blue effect on the video, the viewers will feel they are in the deep sea. When the viewers open their mouths, they will find bubbles are coming out. Such a present creates an augmented reality experiment for viewers by using their mouth to trigger a virtual event on the screen. I think this interaction expands the Human-Computer Interface question without physical touch. In order to trigger the bubble event by opening the mouth, get the top and down points from the mouth, and calculate the distance. The distance between these two points will affect the speed of the bubble particles.

4. The sketch attempt to immerse the viewers into a starfield and they are able to control their speed on flying on that space. I visualized

* Project Context (300-500 words)  
  Write about 2-4 references to related articles, papers, projects, or other work that provide context for your project. Discuss the relationship between your project and these references. Be sure to include a bibliography and use a consistent citation style.