

## Appendix

### Interview with my Client

**Me:** I'll start by saying a little bit about the project. So, for our Computer Science IA, we're making a product for our client that we identify, and I was thinking about making an interactive physics demo for first-year physics. And, I think the project will be done around the end of first semester, so, which units would be around that time?

**Client:** First-year physics, certainly energy, energy transformation, conversions, uh, let's see, circular motion is around that time too I believe, if I remember correctly, Universal Law of Gravitation, those are the ones that jump out at me, uh, momentum. Those are the ones around late December to late February.

**Me:** Ok, and, what do you usually use for demonstrations in class?

**Client:** So, there's Colorado pHet and Physics Classroom, that I use. What might be interesting is for you to look at those and see if you can recall from your first year, like, where is there, maybe, a gap where neither the pHet nor Physics Classroom has a very good one that covers this particular concept, so that might be interesting to do.

**Me:** Yeah, I was kind of thinking about going down that path. What do students tend to struggle with, like, maybe in those units?

**Client:** Some misconceptions that I often notice that students have, like, let's just say momentum, for example, I often get students who have difficulty understanding the difference between an elastic collision and an inelastic collision and might think inelastic collisions don't conserve momentum, that's a common misconception, and elastic versus inelastic, that's sort of a nuanced thing. Also, universal gravitation, just the math, tends to be hard for some students, although I'm not too concerned about that. So those are two that jump out at me, and circular motion definitely tends to confuse a lot of students, the idea that the acceleration is in a direction towards the middle always, you know, if it's uniform circular motion, but the object isn't actually moving towards the center. So, those are some possibilities.