Episode 1 - Honda DC1920
Podcast Transcript

Susannah Howe: Welcome to the Design Clinic Download. In this podcast, we dig into the experiences of Design Clinic teams and classmates through the years. I'm your host, Susannah Howe, from the Picker Engineering Program at Smith College. This episode features three alums from the class of 2020. Elana Helou, Annie Kary, and Alina Siminiouk. Their Design Clinic project with Honda was on the design of a long range heavy payload drone. I'm going to start by asking each of the three of you to just let me know what you're doing currently. Where are you right now, now that you've graduated from Smith? So Annie, why don't you start us off? Let us know what are you doing?

Annie Kary: Sure. So I'm currently a PhD student at the University of Toronto, and I'm studying aerospace engineering and computational aerodynamics.

Susannah Howe: Excellent. Great. And Elana?

Elana Helou: I am a PhD student at the University of Southern California. I'm studying astronautical engineering and focusing on plasma dynamics in the lunar surface.

Susannah Howe: Great. And Alina?

Alina Siminiouk: I'm a software systems engineer at Raytheon in the Boston area, doing software-level design of an anti-missiles system.

Susannah Howe: Excellent. All right. Elana, why don't you give us an overview of what your project was and with whom you worked?

Elana Helou: So we were sponsored by Honda R&D Americas and we worked with them, Honda Aero, and a little bit with Honda Aircraft Company. Our project was to design a long range heavy payload cargo drone, that utilizes the GE HF120 engines that are already used on the HondaJet. So the biggest purpose of this, was to give a new business avenue for that engine in the cargo space.

Annie Kary: So we were doing a very conceptual design, we weren't trying to like, "Here's something you can build in a year." We were trying to like, "Okay, well, what are all of the various ways that cargo needs to be transported and how can we really leverage this engine," which has a lot of very unique properties in terms of aircraft engines for business-class aircraft. And so how can we leverage those, to make the best business jet you possibly could if you had infinite budget, infinite time, to make the best aircraft possible?

Susannah Howe: What were your expectations coming into Design Clinic and how would you say the reality did or did not match those expectations? Yeah, Elana?
Elana Helou: I had the idea that it would almost be like doing a part-time internship, where you were working very closely with a company, well, closely with your faculty and your team, to end up with whatever final project you are assigned to. I think our experience was very close to that. I think Honda took us very seriously and we took them very seriously, and at least I felt like we conducted ourselves very professionally and I felt like if I was in an actual internship, almost none of that would've been changed. So I thought it was a really valuable experience in that aspect.

Annie Kary: I wasn't expecting us to get as lucky as we were, with how much choice we had, especially because we were working with a big company like Honda. I was like, "Well, they're going to tell us exactly what to do," and then they were like, "Do whatever you want. This project should be for you." And I think that was part of what made it so valuable to us, is that we really could make it the project that we wanted. And every time that came up, I was like, "Oh, that's right. I get to pick what I like here." And so that was really nice.

Susannah Howe: Was it at any point ever overwhelming or something you thought, "Wait, I don't want to scope this. I don't want to figure this out. Someone else figured this out"?

Annie Kary: Yeah, definitely. In the beginning it made it very hard to figure out what we were going to do. Because we were just given like, "Design an aircraft," nothing further. So figuring out what we were going to do, was definitely challenging, but I think we were pretty aware that that was going to be an issue. And so we talked a lot in the beginning and we're like, "Okay, well, we know that we get a lot of choice. What do we want to do?"

Susannah Howe: Then pulling on that, what are some skills that you learned in Design Clinic, that you are using now? What would you say are some of the most important things that transferred to your life after Smith? Yeah, Alina?

Alina Siminiouk: I have several concrete examples, because I think Design Clinic is basically bootcamp for systems engineering, if you are open to it as such. Developing and presenting clean and professional slide decks, learning how to communicate with your customer, especially with the different levels of technical experience they may have. Learning how to write solid requirements and generally project management and planning, as we were rotating project manager per quarter.

Susannah Howe: I'm curious, both Annie and Elana are in grad school, what in particular do you think transferred, if anything, from Design Clinic to your grad school environment? Yeah, Annie?

Annie Kary: Yeah. I think one of the big things that translates specifically to grad school, is just the conceptual, like, "I have to do this project over a long period of time," and learning how to pace yourself, because especially the way Smith works with semesters, the longest project you're going to have is a semester long, and that's like, "Your brain can handle that. Two months, three months, that's fine." But when
you start facing down a five-year PhD and you're like, "How am I going to manage to accomplish these goals in the time that I have?" I think Design Clinic was a good warmup. I mean obviously it's only a year, but that's still twice as long as anything I had in the past. So having that, made it a lot easier to face, "How am I going to do with grad school when it's a much longer experience?"

Susannah Howe: Yeah, Elana?

Elana Helou: I agree with exactly everything you said. I know I at least, have a tendency of when I'm looking at a big project, I'm like, "I don't know any of these topics. I don't know these skills. How am I ever going to do this? I might as well just stop now." And Design Clinic was an introduction to view how you break it out into smaller little skills that you can learn at a time. And I think the biggest skill I took from DC, was being able to recognize how to learn new skills.

Susannah Howe: So your class, the class of 2020, experienced the start of COVID, when everything in the world shut down in March of 2020. So I'm curious, can you talk a little bit about that experience and in particular, what was it like for Design Clinic, and what happened with your team and your project, and how did you manage with it through the end of the year? Now, Alina?

Alina Siminiouk: Morale was definitely low and we wished we didn't have that experience for our last bit of our last semester. But I think in terms of logistics of team performance, team deliverables, our team didn't suffer as much. I think we handled the logistic challenge pretty well and gave each other a lot of lenience to accomplish our goals.

Susannah Howe: Yeah, Annie? Want to add to that?

Annie Kary: I don't know, at least for me, Design Clinic really felt an anchor throughout that chaotic experience, because once we were all settled, getting on a call for four, five hours every couple of days and just sitting, basically in silence, working together but having that and knowing, "Yes, I'm still working on this thing, this project that's been going on. And I feel like I understand at this point and with these people that I like, and I know, and I can talk to." It was just a relief to have this, even though the idea of finishing a year-long project during the middle of a pandemic, sounds like hell on earth. And it wasn't fun always, but it was definitely nice to have that sort of sense of stability, "I know what I'm doing and this is under my control."

Elana Helou: I think our project was really forgiving to a situation like this and that we were able ourselves to figure out what's our new scope, what can we realistically get done? We wrote up a couple bullet points and sent it off, and got everyone's approval on it within a week maximum. I remember some other teams were having a really difficult time figure out how to finish or feeling that they weren't able to within the state of the world. So I'm really thankful for our specific project, for letting us still feel at the end, what we finish is not too far off from what we set off to do.
Susannah Howe: So COVID aside, I'm curious, what was your most memorable or impactful Design Clinic experience?

Annie Kary: We went to Westover Air Force Base to look at their big C5s and that was another experience, where it was like people didn't know what to do with us because it was like, I think we were had basically gotten ourselves piggybacked onto a tour with a bunch of military cadets, that were being shown around the Air Force base. And so they're looking at all the planes and they're like, "What are you doing here? Clearly you guys do not fit in. You're asking all the wrong questions."

I was like, "Oh, can I see how the floor picks up, so you can load the things on rollers?" And the guy who's giving a tour was like, "No one's ever asked about that floor." It's what I'm interested in. So I don't know, I felt like every time we would go somewhere and the people who either working there, giving the tour were just like, "why are you here again?" Like, "What?" And we always had to explain that, "Yes, we're doing a project on airplanes. We would like to see the airplanes please." And we also know things, you don't need to tell us everything. We are smart. So that was a continually entertaining experience, is like, "How are we going to be perceived by these usually male engineers, who are like, 'What are you doing?'"

Susannah Howe: With the benefit of hindsight, how do you see Design Clinic fitting into your overall engineering experience at Smith and your undergraduate training for the things you're doing now?

Annie Kary: Being that transition of letting you learn how to do these new skills in a kind of low risk way, if you crash and burn, it's not like you're going to lose your income and health insurance, and have to start all over again. It's a bad grade, you move on, it's fine. So I think having that, is something that I have valued more, and more, and more, and being able to fit that into what I learned in classes. And so pairing those skills together, I have found to be very useful as I've gone on. And then the other thing is, actually, our Design Clinic project has very much informed my grad school, because I had a bit of a fiasco with grad school the first time I applied to everything. And so when I was applying for round two, I actually was applying specifically for aircraft design programs, because I remembered how much I'd enjoyed the Design Clinic project I'd done.

And actually the project I'm doing now, is basically like this project but a 100 times larger, but it's very much this conceptual design cargo aircraft, specialized purpose, weird requirements. And the fact that I am coming into that project with all of my past experience from Design Clinic and just learning how to learn about this kind of stuff, I have felt like I have had a real leg-up from a lot of other people in my cohort, who are coming in from general aerospace backgrounds, but have not designed an aircraft before. I've done that. And even though it was a very conceptual, very high level project, I have a better sense of where everything needs to fit in, and so that's been invaluable, looking back.

Susannah Howe: Alina, what did you want to add?
Alina Siminiouk: I wanted to echo Annie’s sentiment about our capstone experience, really feeling like you get a leg-up, because working with other engineers that have graduated around the same time, there are things where I feel like their capstone experiences are a lot more watered down than ours, where you have the big things of they didn’t have to prepare anything outside of engineering materials, that they didn’t have to make presentations or they didn’t have to develop a business case, interface with a customer. But also small things, where we had to develop a slide master to make sure that our slides looked nice, clean, professional, and we would go through them with a fine-tooth comb several times, to make sure there were no typos.

We made sure to put lot of effort into our graphics, because I had such a great experience with that. I’ve developed a reputation on my team, where people will send me their slide decks to comb through it before they present it to a customer or anything like that, because that was such a focus in our team. And it really was a capstone experience of our time at Smith. Having that experience, put a nice little bow on it, was a great way to say, "All right, you've learned all these skills, time to learn them in a new way and apply them at the same time, and get you prepared for whatever next you do in the world."

Elana Helou: In talking with people from my cohort, undergrads at my school, I've yet to meet anyone who has a capstone experience that is in-depth as ours is. I went to a poster competition for the undergrads at my school a couple months ago and I was looking at some of their projects, and it really feels like just the type of semester projects that you would do at Smith and none of them have sponsors, they don't have design requirements they need to meet, they just, "Here's an idea, here's how it fits into whatever course I'm taking. Here's the answer." Like Alina was saying, the professional aspects and logistical aspects of Design Clinic projects, I think is probably the most important part of it and how it relates to later life.

Annie Kary: I have exactly the same experience on that front. I actually presented our final report to my lab, when I was being introduced to the lab. I was like, "What have I done in the past? Why did I choose the lab I'm in now?" And they were all, "This is so much. You guys did so much work and you all did it to like..." We didn't do incredibly deep technical work. We weren't in there designing micro controllers, but the level of knowledge we all gained about all of these different systems that go into an aircraft and not just how they all work, but how they all interface to make one large system. They were like, "You guys really did truly more than I think we did in most of our entire engineering degrees." We just managed to wrap in so much. The way I think Smith Design Clinic is run, is you really get to know everybody who you’re working with and everybody on every other project.

And so you all are talking about your projects all the time and I think having that constant communication, and you’re always getting ideas from other people and you’re like, "Oh, let me bounce this idea off of you. You have a different project, but maybe you know something about this." I feel like that just develops this very deep knowledge base, that I think is really valuable and Smith really does a good job leveraging, and I think a lot of other schools either don't have or don't realize
that they have that. And so having that, has just been so valuable and so wonderful.

Susannah Howe: I’m curious, what advice do you have for future Design Clinic students, so that they can make the most of their experience? Yeah, Alina?

Alina Siminiouk: One being, really get to know your team, really dive into the bonding experiences. If you don’t know someone on your team, well, try to get to know them. When we started, I didn’t know Annie and Anne as well as I knew Elana. And one of the things that we did to get to know each other better, was get together in Anne’s room and watch Airplane, the movie, while huddling on her blowup couch and spending late nights together, getting food, getting drinks together.

Really pay attention when you get to talking about negotiations, because as someone who had to negotiate their compensation, I found it incredibly useful and incredibly fruitful.

Annie Kary: Really dive into it as much as you can. Obviously you have classes, you have other commitments, you can’t let those go completely. It really is a program that’s designed to help students, A, figure out what they like and, B, get them really thinking about what is engineering? What does it mean to be doing engineering work? And so as much as you can really dive in and learn about your project, and learn about what makes this field work the way it does, I think that is as valuable as having a certain list of deliverables at the end. It’s a learning experience. That’s the whole point. It’s supposed to be fun, you’re supposed to learn a lot. So I think that realizing that you have this incredible learning experience just handed to you and you’re basically told to go run, is again, it’s something that’s pretty unique to Smith.

It’s pretty unique to undergrad in general. Just being able to do what you want to do and learn as much as you can in a relatively low-risk environment, honestly. And then also I really agree with the idea that it’s the people, not the project. I picked this project because I really, really wanted to do this project and then I got incredibly lucky to have an amazing team. But putting as much effort into knowing your team as you do with knowing your project, is absolutely worth it. Because if you’re a good team, you can figure out the project. Even if it isn’t a field you love, you’ll do it for a year, it’ll be great. But if you can’t work with your team, even if you love the field, you’re not going to get anything done. Yeah, the people, it’s so important you have a good solid team.

Elana Helou: One more thing I would add is, to constantly be questioning what you’re doing and why. And I don’t mean that in like, "Why am I here?" kind of way, as in like, "What's the purpose of this and is the effort I’m putting into it, worth what I'm going to get out of it?" We touched on this earlier. But early on in the project, we felt like there was a lot of mixed opinions on what our final deliverable and our timeline was going to look like, and things like that. So as a team, we took it upon ourselves to figure out what we thought was going to be the best course of action and then we sent it to everyone, and made sure everyone was on board with it.
constantly revisiting that, throughout the entire time and especially when we had to move off campus.

And I don't think other teams were really aware that that was an option, that they could stand their ground on what they felt was realistic or not. And I remember on multiple occasions, we recommended this specific process to other teams who are having issues and sent them our examples on how we wrote out what we wanted to do. And I think that's a really valuable skill to know.

And also as part of the ethics of it, you can't just follow whatever your supervisor tells you to do and do it blindly, and just give them deliverable and then disconnect yourself from it. It's your baby at the end of the day, you have to take responsibility over it. And I think that process was really helpful to us and I'm sure it'll be helpful to anyone else that tries to follow through with that.

Alina Siminiouk: I would definitely recommend for people to learn or figure out relatively early on, how to best pitch their project once they have an understanding of how to talk about their project. Because you're going to be going to SWE, you're going to be going to grad school interviews, people are going to be asking you about your project. And it's one thing to say, "I'm designing a plane," and then there's another thing to say, "This is this amazing thing that I'm working on and all of my words show that I have a demonstratable understanding of what I'm doing." It'll help you set up for whatever you do next.

Susannah Howe: I'm curious, is there anything else that you wanted to share? Any other closing thoughts, things that you haven't been able to mention, things that think we should capture as part of the Design Clinic 20th anniversary that's coming up? Yeah, Annie?

Annie Kary: Using the office space. Even just having an office space, that is also something that's very unique and at least for us, I think it helped us work because we all have a place to convene and also you could-

Susannah Howe: And a place to clean.

Annie Kary: Yeah. A place to clean, a place to get a snack, a place to take a nap. And just having a space that you could really devote to this project, made it feel like, "Okay, when I'm going into the Design Clinic club, I'm doing my Design Clinic work. And then I'll spend three hours and I'll get something done, and then I'll go home, I'll do my homework." So it was nice to really be able to partition that out and be like, "This is Design Clinic time. I'm doing Design Clinic and I'm going to hang out with my Design Clinic friends, and I'm going to eat my Design Clinic snacks."

But you immerse yourself in this little world. And I think having that, again, it really strengthened our relationship. It strengthened our understanding of our project and it's so nice. It's just a pleasant experience and it's a really nice office too. As a grad student in a terrible, ugly, disgusting, bug-infested office, I think longingly
about the Design Clinic office and how nice it was. And wow, having windows, I miss having windows so much. So really enjoy it. Use the office.

Susannah Howe: Yeah, Elana?

Elana Helou: I don't know if this happens every year in Design Clinic, but every time our project manager would switch over, we would do a little handover, kind of, and every team had their little thing that they would transfer to the next project manager and add something special. And Annie was our first project manager and she started a tradition where we got a Barbie Dream Copter and modified it.

Susannah Howe: That was still there. Yes, that was still there.

Elana Helou: I love to hear that. I distinctly remember stressing for weeks over what I was going to add to mine and then in the end, I put little engines on it, then that's what our design was going to be. And I loved the idea of doing something like that.

Susannah Howe: How did it work? Was there a little ceremony and you would all have it at the same time, all the different teams?

Elana Helou: Dr. Conley introduced the idea of passing the flag, like they do at military bases when there's a new commander, I don't know what the right word is. And so the first time, I think he played a little song for it and then he would call team-by-team, the person would get up, introduce whatever item they were passing over, whatever modification they made to it and then they would hand it over to the next person, and we'd move on to the next team. But it was a really cute thing to add in.

Susannah Howe: That sounds great. Something I'm definitely going to have to work in, because I was not aware of that.

Alina Siminiouk: Thanks for having us.

Susannah Howe: Absolutely.

Elana Helou: Yeah. Thank you.

Annie Kary: Thank you so much. This has been so much fun.

Susannah Howe: That was really great. And congrats to all of you for doing so well and I look forward to keeping in touch with you in the years to come.