

**Episode 4 – NNE DC1718
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 2018, Leen Ajlouni, Jenny Bahn, and Catherine Ding. Their Design Clinic project with NNE, was on the design of a simulation to analyze and improve a pharmaceutical process.

Let's dive in. I guess I'll start this podcast by asking you to each just say who you are and what you're doing currently. Where you are working-wise, grad school-wise, things like that. So Leen, why don't you start us off?

Leen Ajlouni: Sure. So my name is Leen Ajlouni. I am currently the senior associate for a venture capital fund called North Coast Ventures. North Coast Ventures is a venture capital fund in Cleveland, Ohio, and it invests in early stage startups, usually software startups who are business to business, and usually those startups are a little bit early. They have a product, they've launched in the market, they've generated a little bit of revenue but are looking to get to an inflection point.

So North Coast has invested in more than 60 companies to date and has been doing this for more than 15 years. As the senior associate, I'm the primary coordinator of everything related to our investment processes from sourcing companies to screening them, building our deal funnel, to doing due diligence, and eventually, writing investment memos on these technologies and companies that kind of explain our investment rationale behind our investments.

Susannah Howe: Great, thanks. Jenny, how about you?

Jenny Banh: I'm a research technologist one at Los Alamos National Laboratories. In terms of responsibilities for this role, half of my time is doing administrative work, so things on the computer that help maintain labs and help make sure that the scientists are able to continue their progress. And then, the other half of my time is doing experimental work in the lab, so doing some wet work with some physical chemistry and synthesis. Right now I'm working on these materials called Whispering Gallery Mode Resonators, and our hope with this project is that we'll be able to use these WGM's as gas detection materials for cancer therapies, et cetera. It's a work in progress for sure.

Susannah Howe: Great. Thanks, Jenny. Catherine,

Catherine Ding: My name is Catherine Ding. I am a PhD candidate in biomedical engineering at Johns Hopkins University. My primary research work is in Neuro-engineering and more specifically, neuro-prosthesis. So, we work with these individuals with upper limb amputations and try to do different research work around that in terms of

recording brain signals, how to stimulate them to provide touch sensation back. So things like that.

Susannah Howe: Great. Good. Thanks so much. All right, so let's jump back to Design Clinic. You guys graduated in 2018 and at that time, you were working on a project together. Describe who you worked with and what the project was.

Leen Ajlouni: So, our Capstone Design Project was in the industrial engineering domain, let's say. In kind of the pharmaceutical industrial engineering. The scope of it was to design simulations to help a pharmaceutical consulting company analyze a packaging line for one of their clients in the pharmaceutical industry. And really, to do that, we learned how to use a software called Factory Arena, which helps us map the current process and then also map a new process and be able to simulate both processes to see if one is better than the other, one is more efficient than the other.

So the project was twofold. One was to figure out if there's value in using the software for NNE in general, to help their clients with the consultancy services. And the second was for their specific client, which I think we're still not able to disclose the name of, but it was a pharmaceutical packaging line and they had created an optimized line of that and they wanted to see if that optimized line was more efficient.

Susannah Howe: All right. So I'm curious what your expectations were coming into Design Clinic in the beginning of your senior year, and how did the reality of the experience match your expectations?

Jenny Banh: Going into Design Clinic, my expectations were, there's going to be quite a few late nights, I'm sure, and early mornings as well. And that was just based on what I heard other seniors talking about as I was a sophomore or junior. When I came in, I was kind of expecting more tangible, physical work. I know that there's a diverse group of sponsors and deliverables are different all across the board, but I definitely didn't expect to do a lot of computer work and analysis of optimization. It was definitely something that was not in my experience. So it was, I guess, a humbling experience to jump into something that I hadn't done like that before.

Catherine Ding: I think for me, I was broadly just curious about the experience because I think, like Jenny said, I think in my earlier Smith years, I had heard about Design Clinic just being very different from the rest of the curriculum. And so, I think I was like, "I don't know what to expect, let me just go into it and see what happens." I guess, now that I think about it, as the main expectation I had, more so just being curious about what this means to me.

Leen Ajlouni: Yeah, I'd say largely the same and probably for me word if not from previous classes influenced the expectations that I came in with. But I'd say the biggest difference that the reality had done, maybe previous projects that we had worked on in different classes. I think usually, in classes when you work on projects, they're

not so much like real world projects, so there's always a defined outcome for where you're trying to go and what a passing grade would look like and kind of the scope of your work.

There's a lot of definition of all of that. Whereas, I think here, it was a really good experience of just kind of really solving a real problem out there for a real client. And with that comes the factor of unpredictability. We had a lot of different issues that we just didn't predict up front. For example, the second client or second degree client that change a couple times. The scope of what we were trying to do changed. I think we went to it not even knowing what simulations were and kind of how to use the software. So, it was very different than just working on a project for another course that always had a very defined scope. So we had to get comfortable around kind of pivoting and figuring out direction and trying things and feeling and then doing it differently. So I think that was kind of the biggest difference from other courses previously.

Susannah Howe: I want to talk, at some point, about the skills that you learned and what transferred. But before I do that, I want to set the context of the pathway that you've taken since graduation, but maybe you can just talk a little bit about when you graduated and what career you jumped into and where your path has taken you in that time.

Jenny Banh: So, graduating from Smith, my intent was to go into graduate school for a master's in chemical engineering, but at the same time I was applying for graduate schools, I was also applying for post-bac positions to try and get into the workforce. It was kind of unexpected to get this position at Los Alamos National Laboratory. I came in as a post-bac student. I was only supposed to be here for a year and then I was going to go to UC Irvine for my deferred enrollment as a chemical engineering student. Halfway into my position, I guess, they offered me full time. It just seemed too good of a chance to pass up. I still plan to go back for chemical engineering masters at some point, I'm just not sure when that timeline might fit in right now. The reason why I wanted to do that after Smith, was because I wanted more time to figure out what I wanted to do as a career for the future.

Susannah Howe: Great. Thanks. Catherine, I know you talked about being in your PhD program right now and that's something you... You headed to grad school straight after Smith. Can you talk about that experience?

Catherine Ding: Yeah, so after Smith, my intention was to go to grad school and I ended up in grad school and I'm still in grad school. But along the way, I think there are a couple of points where I wanted to think more, "Is this really what I want to do? Questions like that. So after Smith, I came to Hopkins, started as a master student and that meant taking a lot more classes and then start doing the in semester research because I had never done that when I was at Smith.

So, the master's program was two years and then, that second year was basically just full time research with no classes at all. So at that point, I applied for PhD

again, it was not like a continue program, so I had to apply again. And I briefly considered maybe looking for a job wouldn't be too bad, but also, I decided to stay in the research world for now, just because I think the field that I want to work on, neuro-engineering, is still very, very young and so I want to spend a lot of more time, kind of at the forefront.

Leen Ajlouni: So, I think when I was in Design Clinic, I really didn't know what I wanted to do. I was always interested in the intersection between business and technology. The internships that I had done throughout college were always more in the consulting business space than practicing engineering, specifically. But really liked engineering, really liked learning about technology and how it worked, just didn't know what career paths I could take with that interest.

In hindsight, now that I work in venture capital between technology and business and seeking really cool technologies, seeing the feasibility, the commercial ability of those companies and bring them to market, it requires both knowledge in the technology. So you have to have a little bit of a technical background but also the business context to able to put them out there and think about their viability. So it makes a lot of sense for how the path that I took came to be and how it unfolded.

I think I was very intentional about always pursuing things that were at that hybrid, were at that intersection. But actually thinking back, the first internship or opportunity that I had right after graduating, was actually an industrial engineering opportunity at the Cleveland Clinic, and it was a three-month program. It was actually very closely related to our capstone design project. So it was around process improvement, I was taking a patient intake process at a major hospital in Cleveland and being able to optimize that and it actually uses a software very similar to Factory Arena and it was the first opportunity that I got, which took me to Cleveland.

And after that, I found an opportunity in an accelerator. So I feel like my Design Clinic project actually was very influential in how my path came to be, because if it wasn't for my industrial engineering background, I probably wouldn't have pursued the internship, which then took me to Cleveland, which had introduced me to my first job at an accelerator, which took me to venture capital. So I feel like every step in the way was meant to be, for me to be where I am today. And truly looking back, I feel like my Design Clinic project was influential that way.

Susannah Howe: That's great to hear. And it sounds like there was an almost direct connection between the kind of project work you did and the internship, which may not be at all the case for Catherine and Jenny. And so, knowing that there could be quite a big gap between what you worked on in Design Clinic and what you're doing now, I'm curious. What skills, if any, transferred from your Design Clinic experience to your life afterwards?

Jenny Banh: Having and holding meetings and making sure that they're efficient and on track. I've noticed a lot of folks at the lab, they love to just talk about everything and

anything that's not what is relevant at that moment because they... I don't know if it's that they need a break from their constant work or they just want to spend some downtime talking with someone else but, especially when I have meetings with principal investigators or even the employee resource group that I'm a part of, I strive very hard to make sure that we stay on track and hit all of the agenda points that we've outlined prior to our meetings. So that's something that I've taken away from Design Clinic.

Catherine Ding: For me, I want to say several things and then plus one more that I'm not sure if scale is, I guess, the precise word for it. But I think in general, I really agree with Jenny. Communication, I think, it was a big thing that I learned in Design Clinic and also continue to use one. Other thing that I think is even more important in terms of transferring the skill, is being able to give and receive feedback. And sometimes, the feedback isn't... Maybe it's constructive criticism or something that might not be, I don't know, soothing to the ear. But I think I started learning that in Design Clinic, how taking honest feedback from others and learning, "This kind of feedback is actually very helpful." And sometimes when we just focus on the work that we are doing, how does that feedback contribute to the team contributing to the project?

And then also, is a skill to plan something when the path isn't clear yet. When we were in Design Clinic, I remember we were like, "We don't know what to put as our goals. We don't know what our next steps are. Maybe we only know what to do this week, we don't know what to do next week." So a lot of it seems similar to a grad school project. That's definitely something that is very relevant and something that I continue to learn in grad school.

Leen Ajlouni: I think I would echo the communication skills that Jenny and Catherine spoke about. I feel I'd add to that as well. The structure that you had, Susannah, about the agendas coming to our weekly check-ins and kind of the structure that we had to have, I think that discipline was instilled in me, truly, throughout my years and at work because every time I have a meeting I always think, "What is the objective? What am I trying to accomplish?" Always making sure everyone in the meeting is aware of what we're trying to do.

So coming into meetings prepared, always having a very clear objective. I think that discipline really came from a Design Clinic experience. And also add, the project management or project manager kind of rotation that we had in our team was also really helpful because I feel like it taught us the different styles of leadership. Whether that meant sometimes you have to take ownership and bring the team together, whether from a project perspective or energy perspective, sometimes kind of taking that ownership role. Sometimes you have to follow and let someone else be the leader and figure out their side. Sometimes you had to manage up a little bit with your liaison or people that you're working with. So it really taught us a lot of different leadership styles that I think were also really helpful as I worked with different teams and different styles of leadership, that was helpful.

- Catherine Ding: For me, when I started the project, I guess at the beginning of senior year, I was nervous that I would not be placed in "my first choice" because at that time, I would think the first choice was the most relevant to my development in terms of post-college goals. Then, I'd very much want everything to contribute to that goal. And I think to me, at that time, it was not ideal if I was not working on, I don't know, biotech company or on a project that's more biotech related. But I think it's actually because of this difference, it made Design Clinic or the project that I worked on, really stand out from everything else and it kind of taught me it's okay if something is not the way you thought it would be. Very much of the rest of things in college has been that way. It's a very good experience and I think it's a very good skill or mindset to have, just to be open to all of these opportunities and not be afraid of feeling something might be pulling you a different direction.
- Susannah Howe: It's a very positive way to put it. And I know that this was a project that was not one that you all necessarily came into knowing that it was exactly what you wanted to be doing or that you had a sense of where you would be going with it. And I was impressed with your adaptability and your resilience and your openness to learning new things throughout the project as it unfolded for all of us.
- Leen Ajlouni: From a technical perspective, I think the word that comes to mind, similar to what Susannah just spoke about with adaptability and resilience, I think it's agility and it's something that I actually always look for in entrepreneurs in venture capital when I do my job, is making sure that they have the trait of... They can pivot when needed, they can figure out when something goes not the way they expect it, can they determine a different path, can they learn from it? Do they have that adaptability and agility?
- And I think that's a trait that is important in a lot of different fields, not just entrepreneurship, but it's one that I feel like, due to the nature of our project where we had a lot of hardships and just really not sure where we're trying to go with it, I think it really taught us to just keep going, be resilient, be determined and trust the process as we went as well.
- Susannah Howe: Were there particular memorable or impactful experiences that you had as the project took its twists and turns?
- Jenny Banh: I wouldn't say it was impactful, but memorable for sure. And I don't really remember why this happened, but one late Tuesday, I remember setting up an air mattress under our group desk or table or cubicle and spending the night in Design Clinic. I don't know if it was, I had to do some late night work on the project and had an early morning, I had to get to classes or maybe a flight, I'm not sure but that was a memorable experience for me.
- Susannah Howe: I hope you got a good night's sleep.
- Jenny Banh: It was all right.

Leen Ajlouni: I think I alluded to that earlier in terms of the change in clients that we were working with. So we had two stakeholders, we had NNE and then we had a confidential client who was NNE's client. And I remember the second client, it changed mid midterm. So at some point, we didn't even have an end client. We weren't sure how that would change the scope of the project, but I don't think we lost our momentum. I think we kept going and I think Susannah, you really played a role there, just to give us the reassurance and there was still a lot more to learn.

And even just the first objective of the project, we were just evaluating simulations in general. That was still interesting enough. So I feel like we were the team, I think a lot of teams were talking about us at some point like, "Oh, they're the ones that are struggling. They don't even have a clear client and they're operating in an industry that they didn't take a lot of classes in." So it was a lot of new paths that we were taking at the same time. But it truly made it an interesting experience and interesting story in hindsight.

Susannah Howe: I do feel like, in the end, it really did all come together, but it was not necessarily the journey you were expecting.

Leen Ajlouni: For me, I think the collective experience of being in that workspace where everyone was working in the projects, we all felt like we were learning from each other. So there was a lot of transferable knowledge from people going through their own projects but sharing best practices and talking about it in the lab. It felt like we were all going through it together. When I remember Design Clinic, I remember that. I remember the lab, I remember the tables, I remember the snacks, the community, the people. So to me, that is the most memorable part of experience.

Susannah Howe: So in the benefit of hindsight, how do you see Design Clinic fitting into your overall engineering experience at Smith?

Catherine Ding: I think for me, it was just kind of on its own, if it makes sense. Because most of the rest were classes, class projects, and even for my summer time during Smith, I spent doing surf or summer research elsewhere. And also, I'm in grad school and I also was still in kind of the research lab setting. And so to me, it was really cool to have a glimpse through Design Clinic, what something, other than a research lab, could look like.

Leen Ajlouni: I think for me, it gave me a really good taste of the real world. I think it really helped to have a very smooth transition from school to work. Having had that experience to work with a real company, real client, on a real project and not a lot of students get to do that in their school years, so for us to have had that opportunity... Also, to market it. When we interviewed for jobs or grad school, I'm sure it still was compelling to talk about these stories, talk about this experience, talk about the impact of the experience too because we did have impact on a real client. So to me, it was that kind of smooth transition to work, both from a soft

skill, hard skill, but also just the experience and exposure were very important to me.

Jenny Banh: I really enjoyed how it kind of culminated all of our academics, but it allowed us to have the experience of a real world client and to kind of take control over a project. Most of our classes, we had an end goal where something was right or wrong, but like Leen had said earlier, this was this real client who... There were, not concrete outcomes for this project, but we could see the impact of what work we've done and how it might benefit the clients. Being able to take hold of that project and have it be our own was, I think, a good experience to round off the end of the engineering program as a student.

Susannah Howe: So, what advice do you have for future Design Clinic students to make the most of their experience in their senior year?

Leen Ajlouni: Embrace the process or trust the process. I think there will be inevitable twists and turns in the way. And similar to our experience, there were a lot of unpredictable factors like I mentioned before, but I think it makes for a great story and in the end, great stories are always very compelling. Whether to your interviewer, to your resume, for anyone really. I think it tells us how you think and how you navigate and how you're flexible, adaptable. So it says a lot more about you than what milestones you achieved or what checklist that you eventually landed on.

So yeah, I'd say embrace that, and even if there's a lot of challenges and hardships, I think it will make a stronger experience. And looking back, today, we laugh about it, we embrace that, but I think it was difficult, for sure, during that time. But now, looking back, I think it made all of our experiences rich in some ways and kind compelling to the next steps that we ended up pursuing, which are very different from everybody else

Jenny Banh: My advice would be to engage in a lot of team building outings. Go downtown, grab some coffee, grab some ice creams, grab lunch, dinner, whatever it might be. You know, you spend so much time with your team in Design Clinic, but I don't know if you spend a lot of time with them outside, getting to know them as people, aside from just students and creating that camaraderie.

Catherine Ding: Don't be discouraged and just keep a curious mindset approaching the entire year of work because I think, like Leen said, that experience is worth it regardless. And I think you'll probably learn something unexpected and good.

Susannah Howe: Is there anything else that you want to share?

Leen Ajlouni: I just think it's really interesting how all of us took very different paths after Smith and we did the same project, but it was, hopefully for all of us, it was transferable in some ways, but we ended up pursuing still very different paths. So I think regardless of what project students end up doing, there's always a path to make out it. There's always transferrable skills and a way to connect the dots.

Susannah Howe: Thank you so much for your time and for coming back and being part of this and sharing your ideas. It's been really fun to reconnect with you and I hope I'll get a chance to see all of you on campus again at some point. I really appreciate it and I'm so glad that you're part of this broader Design Clinic community. It was great to talk with you today.

Leen Ajlouni: It's really fun. Great to see you Catherine and Jenny, to catch up a little bit. Absolutely. Thanks everyone.

Catherine Ding: Bye.