

Yale

Innovative Students Turned Thriving Entrepreneurs

Three innovative alums discuss their time at SEAS, launching start-ups, and offer advice for aspiring entrepreneurs



Left to Right: Elizabeth Asai, Ellen Su, and Monika Weber

With so much innovation at SEAS, it's no surprise that numerous students have gone on to form their own start-ups, some even while they were students at Yale. Here, we talk with three of those enterprising alums — Elizabeth Asai, Ellen Su, and Monika Weber — about how they got their start and what advice they have for any aspiring entrepreneurs.

An Up-Close Exam from Afar



It was while working on a different project that Elizabeth Asai '13 and Elliot Swart hit upon the idea for 3Derm Systems, the startup they founded while students at Yale. The 3Derm platform allows patients to take high-definition, standardized images of skin abnormalities and upload them to a telemedicine portal. Dermatologists with access to the portal can then assess the images and get a sense of whether the patient needs a referral for an in-person visit, and if so, how urgently the patient needs to be referred.

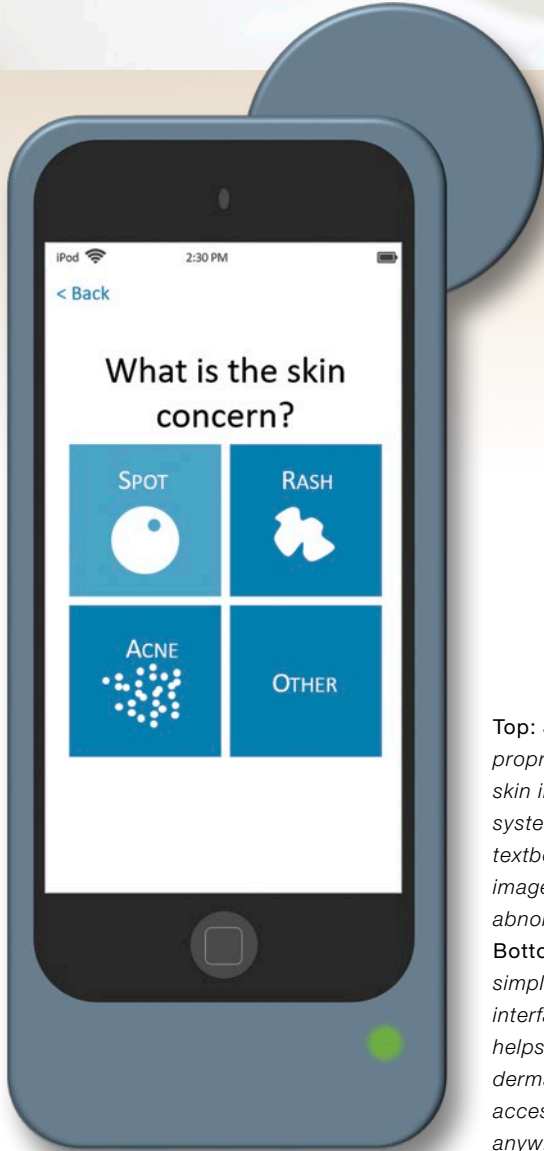
With advice from their Yale mentors, and a prototype that they developed for \$400 using a 3D printer, they soon had the basis for their company. Within a few years, they had raised more than \$5 million. Fast forward to 2020 and 3Derm was acquired by Digital Diagnostics, an Iowa-based company specializing in autonomous AI systems for healthcare, where Asai now works as Vice President of Dermatology and Swart is Chief Architect.

Did you come to Yale with the goal of starting a business?

I think the world has changed a bit since I was in college, and a lot more people are going to college thinking they want to launch a startup. But I definitely was not in that camp. Elliot was — he came from Palo Alto, so everyone he knew already had a startup by the time we graduated from college [laughs]. I thought I was going to med school or into the healthcare business, which

Continued →





Top: 3Derm's proprietary skin imaging system captures textbook quality images of abnormalities. Bottom: Its simple user interface helps provide dermatology access from anywhere.

I guess is where I ended up. But I didn't think I would do something as risky as this.

When did you realize this could be the basis of a startup?

We had a lot of really good feedback early on from people who mattered a lot. We were meeting doctors and different engineers — people from the healthcare world who seemed to really get behind this idea. They were telling us, 'You're onto something — this is a big issue.' That kind of feedback from people who were way smarter than we were was good validation.

You majored in biomedical engineering, and Elliot was electrical engineering and computer science.

How important was having that combination?

That was huge. Between the two of us, we covered most of the base technical knowledge we needed to get started. As most people in the startup world will tell you, hiring tech talent is really hard early on because you're competing with all of the other cool stuff that engineers can go work on, and engineers are really expensive. So, the fact that we could prototype and get stuff out there on our own was a game changer at the beginning. Then, the key pieces missing were on the business side and anything to do with commercialization. But that's where we found a ton of really good mentors.

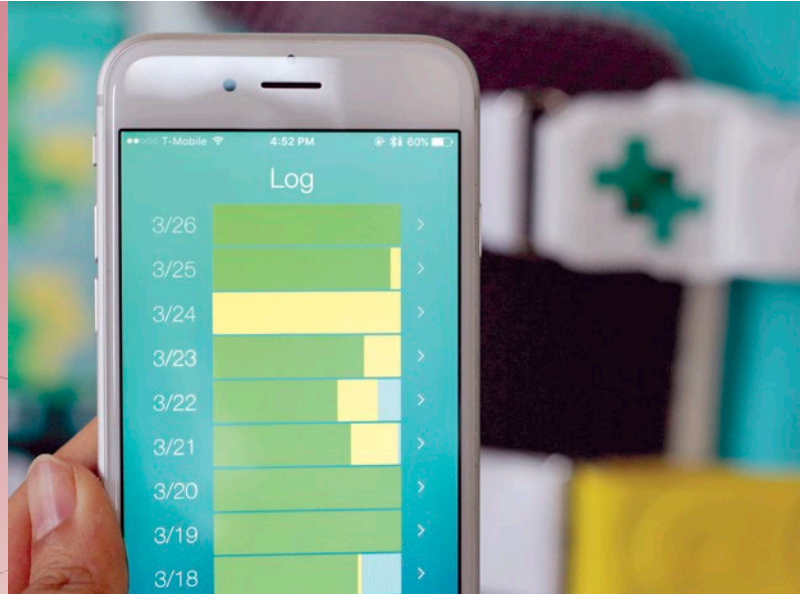
You got a lot of support from Yale, including SEAS, the Department of Dermatology and the Yale Entrepreneurial Institute.

That was really nice. I don't know how many other schools do anything like what Yale did for us in the early days. They saw promise in this and wanted to see if this could work, so people opened doors for us. We were the youngest people to get the National Science Foundation's Small Business Innovation Research program. We had three tenured professors who had gotten tons of these grants over their careers, and they read our application and gave feedback. People who are mid-career applying for these grants would kill to have that kind of access. We were 20 years old and didn't know how lucky we were.

Launching Business a "Cinch"



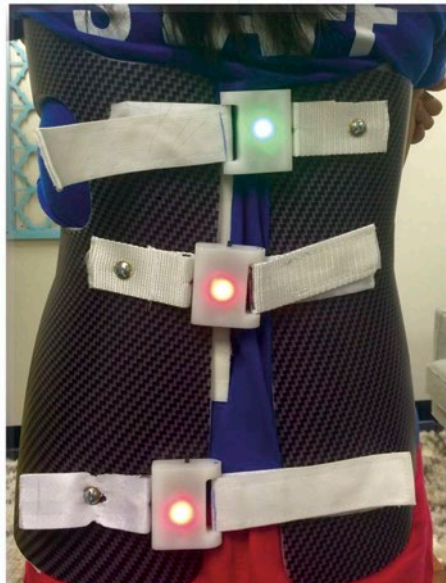
Ellen Su '13 was still a Yale student when she founded Wellinks with Levi DeLuke '14. The startup focused on "Cinch," a smart strap for scoliosis braces aimed at giving its users, especially children, a greater sense of independence. With a Bluetooth connection



to a smartphone app, the strap collects data for the patients, their guardians, and their doctors on how the brace is being worn and whether it's adjusted correctly. In early 2020, Fairfield-based Convexity Scientific acquired Wellinks and hired Su as its Chief Product Officer. Convexity, now known as Wellinks, created a portable nebulizer that aerosolizes medication for people with chronic obstructive pulmonary disease (COPD) and asthma.

Looking back, what were some key decisions that you made?

I would say one of the biggest influences was getting involved with Design for America, cofounding the Yale chapter, and learning more about human-centered design. That really inspired all the work that came after that — learning about the design process, about human-



Continued →

Top: Data is continually collected to determine if the brace is being worn correctly. **Bottom:** Su credits human-centered design as one of her biggest influences.



them — things like getting a mentor at Tsai CITY, going to specific talks. I never did as much of that as I could have, and that’s one of the things that does go away — you don’t have a second chance to do those things once you graduate, so take advantage of those resources while you can.

It seems one of your strengths was being open to going in entirely new directions.

I was never one who had a career planned

centered empathy processes, and it really spoke to me in terms of how I approach problem solving and how I approach the world. Also, the fact that you could use a very broad skill set. Understanding technology is great, but it’s not the same as being able to think creatively and make creative applications from those things.

out and it was always very stressful to me when someone asked, ‘What do you want to be when you grow up?’ That was never a question I knew how to answer. I still don’t have a good answer for that. The answer I found is more about, ‘What kind of work do I want to do and what environment do I want to work in?’ That’s more important than the title or specific place where I end up.

The second thing that really helped us was the Center for Engineering Innovation & Design (CEID) Summer Fellowship — that opportunity to spend 10 weeks over the summer full-time on a self-directed project — that was something we just didn’t have the luxury to do during the school year. I’m also just a big proponent of people being in New Haven over the summer — I think it’s a very different learning experience.

What advice do you give undergraduates considering a startup?

My general advice for any student I talk to is to reach out to people. Just go and spend as much time as you can learning from people in the field. People are very willing to help and are open to sharing what they do. For me, that was incredibly valuable. Send emails, talk to people, reach out on LinkedIn — the worst thing that can happen is that people don’t respond to you.

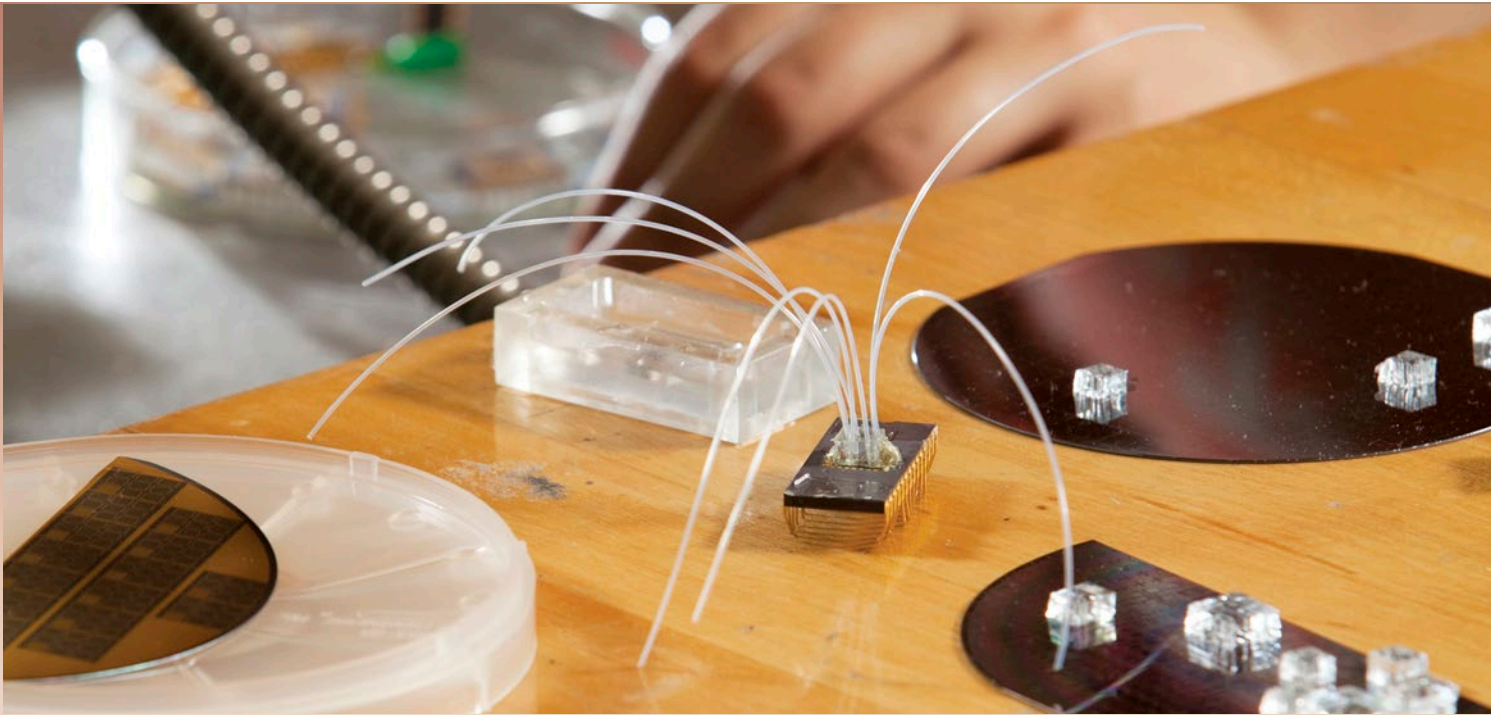
The second bit of advice is to take advantage of the Yale resources as much as you can. A lot of people are open to help as long as you ask and as long as you keep up with

Detecting a Need



Dr. Monika Weber, CEO and founder of Boston area-based Fluid-Screen, co-invented the bacterial and virus detection and identification technology that her company is based on while still a graduate student in Electrical Engineering at Yale. The Fluid-Screen platform allows users to place a sample directly on a microchip, bypassing the time-consuming step of culturing samples on a Petri dish. The biosensor can detect bacteria in liquid samples in a matter of minutes, with an accuracy greater than 99%.

The company, founded in 2015, is currently working with several major pharmaceutical companies and preparing to send its first prototype to numerous experts, who will use the technology and provide feedback.



When you came to Yale, did you have plans to eventually start your own company?

Yes, I was very excited about the entrepreneurial mindset and that is one of the reasons I came to the U.S. I really wanted to be at the intersection of cutting-edge science, technology, and commercial applications.

When did you know that your work could be the basis for a start-up?

It started in 2011 when there was the outbreak of *E. coli* contamination in Europe. There was *E. coli* in the food supply, and by time the produce arrived, there were still no test results. Thousands of people got sick, and over 50 people died because they were not able to test and contain the contaminated produce.

I already had some background — I took some classes, including a medical design class where my colleagues and I designed the first concept behind Fluid-Screen. It was a device that would detect the bacteria in meat. When the outbreak in Europe happened, we had already been thinking about it, and I realized that there was a huge need, and we had this solution.

What advice would you give students with similar ambitions?

I would say that the key thing is people. Find people who would be supportive — that matters a lot. And teammates

Above: The Fluid-Screen platform allows users to place a sample directly on a microchip. It can detect bacteria in liquid samples in a matter of minutes, with an accuracy greater than 99%.

who want to see the idea through to fruition. I'm really grateful to [SEAS Deputy Dean] Vince Wilczynski, who was really one of the first people who supported me and really helped me get on the pathway from a scientist to becoming an entrepreneur. And I really want to thank my early investors in Fluid-Screen whom I met during my time at Yale through the Yale Alumni Association. And of course, Dr. Jim Tyler '65, who was the main founder of the CEID, is also a Board Director and an investor in Fluid-Screen, so I have this amazing opportunity to work with him to learn from him, and hopefully replicate his success in the business world. David Cromwell, who was a finance professor at the Yale School of Management and the first Board Director at Fluid-Screen, helped me get the company off the ground and was a much-valued mentor.

You took part in the SEAS Advanced Graduate Leadership Program (AGLP) — how did that help?

I loved it — as part of AGLP, I took classes. It was one of the reasons I was able to take classes at the School of Management. Then I encountered some wonderful mentors, and the program also provided lots of coaching, so both AGLP and the CEID were very instrumental for me at a very early stage of starting a venture. 🏆