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Interviews of the Margaret MacVicar Memorial AMITA Oral History Project

Ellen Catherine Hildreth

Class of 1977 (BS), Class of 1980 (MS), Class of 1983 (PhD)

(interviewed by Catherine Poon)

December 9, 2011

MIT Women's Oral History Project

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MIT Class of 1977, B.S in Mathematics

MIT Class of 1980, M.S. in Electrical Engineering and Computer Science

MIT Class of 1983, Ph.D. in Electrical Engineering and Computer Science

This interview was conducted on December 9, 2011 by Catherine Poon (Research Assistant to Professor Margery Resnick) in Hildreth's office at Wellesley College. Hildreth was Poon's Computer Science professor and the Department Chair of Computer Science at Wellesley College.

ALUM: Ellen Catherine Hildreth - Class of 1977 B.S. in Mathematics, Class of 1980
M.S. Electrical Engineering and Computer Science, Class of 1983 Ph.D.
Electrical Engineering and Computer Science.

INTERVIEWER: Catherine Poon

DATE: 9 December 2011

LOCATION: Wellesley, MA

PURPOSE: MIT Women's Oral History Project

Poon: This is Catherine Poon with the MIT Women's Oral History Project and I'm sitting here with Ellen Hildreth, MIT Class of 1977 with a B.S. in Mathematics, Class of 1980 with a M.S. in Electrical Engineering and Computer Science and Class of 1983 with a Ph.D. in Electrical Engineering and Computer Science. Ellen, thank you for joining me today. Let's start by talking a bit about how you came to MIT. Where did you grow up? And how did you hear about MIT?

Hildreth: I grew up in this area of Massachusetts. I lived in Framingham and Ashland. I went to Ashland High School. In terms of how I heard about MIT, MIT was a place that people in this area know about. It's a big science and technology school, and so, teachers from my high school would talk about it as a place that I might be interested in because I was very interested in math and sciences. Partly because of proximity and also because of my interests, it was an obvious place to consider. There were a lot of things that I considered that would help

me to see that MIT would be a good match. We didn't have a formal calculus class in my high school, but my math teacher ran a little math club and he taught us some calculus and some computer programming. I really loved that. It was a group that was all boys and me, and that was okay. I was part of the group, and it felt like a perfectly natural thing. I had a physics teacher who really encouraged me also to go to MIT, as did my math teacher. When I was a senior, I took an electronics class. This was a shop class for boys, and not something a girl had ever taken, but I expressed interest in it and there was no resistance, and the teacher was very welcoming. I think having a little engineering exposure helped me see that MIT may be a place that I would be interested in. At the time, I think MIT had maybe 15% women, but that wasn't something that really worried me because in high school, the kids who I felt most comfortable with and closest to academically were all boys. What was nice was they were not nerds [laughs]... they were very well-rounded. They did sports; they were fun, sociable people; they were normal. I really enjoyed my interactions with them. They accepted me, and so I just felt comfortable in that kind of setting. And so, I came to MIT with a very positive attitude.

Poon: That's great. So, you said that you got a lot of positive encouragement from your teachers, but did you know anyone who had previously gone to MIT that you really looked up to?

Hildreth: I didn't know anybody, and I don't think I really knew how big of a place MIT was. It was a science and engineering place, but I didn't really know the kind

of place I was getting myself into because I didn't know anybody who had been there.

Poon: Upon your arrival, did you find the classes exciting, challenging or a breeze?

Hildreth: It was really exciting from day one. My first semester, my calculus course was taught by George Thomas. He wrote the calculus textbook that I used in high school, and I got his autograph! [laughter] I took a physics course with Anthony Philip French who wrote the physics textbook that was used in those days. A lot of the lecturers that I had at MIT very early on were very wonderful and inspiring and entertaining. If they didn't write the textbook, they were the fathers of their fields. I think about my computer science classes. MIT was one of the places where computer science really started, and you could take courses from these people as an undergraduate. And that made it very exciting. It was also very challenging too, but I liked that aspect of it. The other thing about first arriving to MIT was that from the very beginning, it was really an eye-opener. That's why I say that I really didn't have a sense of what I was getting into when I first came. When I went to that freshman picnic on the first day on Kresge court, the first students that I met – one was coming from Venezuela, another was coming from Europe, and another one was American but coming from California – and these students had big ideas about what they wanted to do. They were talking about things that I had never even heard of in high school, and I had come with this attitude that I was going to get a Bachelor's degree in math and I was going to go back and teach at my old high school in Ashland, but that all changed. MIT was just a place where

people came and wanted to do big things. And that just rubs off on you and everything that you do.

Poon: So, you've always known that you wanted to study math at MIT?

Hildreth: Yes, I was interested in science as well, but I think essentially mathematics was the way that I headed first. I really like puzzles and logical thinking, and so that's why I was attracted to math. But at MIT, you could specialize in either applied math or theoretical math, and I realized pretty early on that theoretical was not for me. [laughs]. At one point, I took a course on combinatorics and graph theory which has a similar course to that at Wellesley, which is the course that is most similar to computer science, and I just really loved that. Those are the sort of things that started me towards computer science, and then I took my first computer science course, and loved it. This was in the old days when we had to still type these punched cards, and your program was a whole series of punched cards, and then, you would take them to a center where they would run your program over night. Then, you would come back and see the results!

Poon: Wow! It is so different now! I can't imagine de-bugging a program and waiting over night!

Hildreth: Exactly! And, it took so much time because if you had a bug, then you had a problem.

Poon: Well, that might have helped students' problem solving skills.

Hildreth: Yes, that might be true.

Poon: That is something that I love about computer science and math. I love the problem solving and strategy skills that you learn. But, also trial and error! Some times that is a skill you have to learn as well. So, you mentioned that during your time, there were about 15% of women at MIT. Do you know how many women were in the math program with you?

Hildreth: The math classes tended to be fairly large classes of 50 to 100 students in a large lecture hall. And I would go in, and only see a few women in the lecture class kind of scattered around. It was all formal lectures, so there really wasn't an opportunity to interact with the other women in the class. So, there were very few women in the math program, and even fewer that I interacted with. But, then I started to take classes in computer science, and I stayed a math major just because it was a very flexible major that didn't have a lot of requirements, and I knew that math would be helpful for computer science. I could be a math major and just pick and choose which math and computer science courses I wanted. If I didn't want to do many courses in electrical engineering, then I didn't have to. But those types of courses were different because you had lectures and then you had recitations that were maybe 20 students or so, and then you had small tutorials that were three or four students in a problem solving type of session. You would also do your work in labs, and you would converse with your neighbors and be working with people and asking questions. There were some female lab TAs, so there was a lot more interaction with women and a lot more opportunities to have interactions with women. In those days, I don't think there were any women in the math

department on the faculty. While I was there, the first woman on the faculty joined around that time. And it had a reputation of not being a particularly supportive environment for women and certainly at the faculty level. I felt a little more closeness in the computer science department.

Poon: Did you feel that you were closer to your female or male friends? Who did you gravitate towards when you had some spare time?

Hildreth: A lot of my friends were from my dorm. I was in a co-ed dorm, East Campus. There weren't that many women on my floor. The year I entered, there may have been one or two freshman women on my floor, and maybe three or four upperclasswomen. I did socialize with them, but mostly it was with the guys. There wasn't so much interaction in classes, but more outside of class. My sophomore year, I started a UROP (Undergraduate Research Opportunities Program) in the Artificial Intelligence Lab. I worked in Seymour Papert's Logo Group, and they create educational environments for children and use computers as tools to facilitate learning in children. There was a faculty member in particular, Hal Abelson, the author of *Blown to Bits*. He was my first faculty mentor, and I worked very closely with him when I was an undergraduate. I worked with the Logo Group during my years as an undergraduate. There were a number of students who did UROP's in the A.I. Lab. There was a mixture of men and women, and that really became a social group. So, I had my dorm social group, and the group at the A.I. Lab – and those are the people that I hung out with mostly as an undergraduate.

Poon: Were you involved with any activities? Did you have any spare time in between working and studying?

Hildreth: I didn't have much spare time. [laughs]. I did my schoolwork, worked in the A.I. Lab, and I had a job working for the dining service. There was a grill called Pritchett Lounge where I worked. And I was an MIT tour guide – and I loved that! I loved MIT and I loved showing it all off. It was also special because as a women student, particularly if there were other women as visitors, I could show them that there were women students there too! And there some labs that were fun to show off, such as Doc Edgerton's Strobe Lab. When we would go there, if he was there, he would demonstrate the strobe lights, and he would give everyone a postcard of a bullet going through an apple. That was a lot of fun. It made me feel like I had a real connection to MIT as an institution because I got to present it as a tour guide. So, those are the kinds of things that I did. Another thing that I would do from time to time was either walking or jogging around "the bridge circuit." You would come up Mem Drive, go to Longfellow Bridge, follow the Esplanade to the Harvard Bridge. It was just so wonderful to be wandering around there, and feel like MIT is so far away. That was something I would do to just relax.

Poon: What are the most valuable lessons that you learned during your time as an undergrad?

Hildreth: There are three things that I think are the big lessons. One is to think more broadly. That is something that I mentioned to you about the freshman picnic on day one, it was just an eye-opener for me. But that was reinforced. People

come to MIT with big ideas and that rubs off on people. Another important thing is that when you were in high school, you may have been the most successful. I was valedictorian of my class. But, you come to a place like MIT and everybody is really smart and really talented and really accomplished. It can be overwhelming at times, but you have to feel comfortable. You have to feel like there are things that I can contribute here, but maybe I'm just an average student at MIT, and that's still a good thing. You are also really challenged at a place like MIT and you have to be willing to fail sometimes, and you have to feel comfortable. And, that is also tied up with coming from a context where you may have been particularly successful, and you can't get so wrapped up in that that you can't accept that you may hit those walls, and you can't do something and you may fail and get a poor grade on your exam. You have to be able to accept that, and use that to become stronger because of that and move on. Or even, use it to help you understand what your strengths and weaknesses are because everybody there have their strengths. And this is true of Wellesley too. Wellesley students have that experience as well. They were particularly successful and then, they come here and are part of a community of all very successful people. You have to appreciate your strengths and your weaknesses, and be able to accept it all. So, those are the things that I learned as an undergraduate.

Poon: That is a lot of great advice! After your undergrad experience, you went on to get your Masters and Ph.D. at MIT, so you obviously loved the school. But, you switched to electrical engineering and CS. Was that where you developed

your interest in edge detection? You have so many well-known publications on it and have given talks on it. So, could you please talk a bit about how you became interested in it?

Hildreth: Sure, as I said, I worked with the Logo Group as an undergraduate, and Hal Abelson, he was really my first mentor, he was extremely supportive and a tremendous source of academic advice. He helped me get involved in projects and so on. He was one of the primary people who encouraged me to apply to graduate school there. I had every intention of continuing to work with that research group as a graduate student. If I could pull out my essay for graduate school, it was all about education, working with the Logo Group, and science. But after I had been accepted and before I started as a student – it may have been in the spring or summer before I started as a graduate student – David Marr, who is one of the intellectual forces behind the interdisciplinary approach to the study of vision, combining neuroscience and computer science. I didn't know this at the time. I was just sitting in the Logo Lab one day working at a computer, and David came down. He was looking for me, and he came up and said, "Hi, I'm David Marr. I'm working in vision. I work upstairs on the 8th floor, and I'm looking for new students for my research group. If you're interested, come talk to me." He was very charismatic. He was very intellectually-driven kind of person – a real visionary. A lot of energy. I went to go and talk to him a couple days later, and there was just no looking back. The Vision Group at MIT had tremendous visibility outside, and created a lot of opportunities for me to not only be part of a localized group

there, but also part of a broader scientific community. His group was a very close knit group. Something that impressed me most about him was that I had very limited background in that area and that was okay. I just had basic skills, but I was interested and passionate about it, and so I was able to find my way. That work really helped to drive what courses I took and what things I did in terms of the research that I did. The research that I did as a Masters student was the edge detection work – that you were referring to. But, sadly, shortly after I started to work with him – and partly why this brings tears to my eyes – he developed acute leukemia. Shortly after I finished my Masters thesis around 1980, he died of the acute leukemia. It is incredible to think about what he might have accomplished if he hadn't died, but I think part of that experience of his group and the illness created a real sense of urgency and importance for the work. His first Ph.D. student was Shimon Ullman, whom I then worked with for my Ph.D. Shimon and David were both tremendous mentors, as well as a number of faculty doing vision research who were part of his group and some were outside of the group. People like Berthold Horn who was in the Computer Science Department and Whitman Richards in, those days it was the Psychology Department, and David Marr was also on the Psychology Department, and that's what became the Brain and Cognitive Sciences Department there now. Tommy Poggio, at the time that David was there, was in Germany at the Max Planck Institute, but he had come to visit and was a strong collaborator of David's. When Tommy came to town, all of a sudden the energy in the place would triple. There was all this flurry of

activity. And you would be at home early on a Sunday morning and you would get a phone call from David, and he would say, “You know, Tommy and I were just working on something and we wanted to talk to you about it. By any chance, were you going to be coming into work today?” And you’d say, “Oh! Of course, David, I was just having my breakfast, and I’m on my way out the door!” And this is after he got you out of bed! [laughter]. People like Tommy, Whitman, and Shimon, everybody was very supportive – and that really helped me to feel much more comfortable. What I did was very interdisciplinary, even though I was in the Computer Science Department. They were very flexible. You could be a student there, but your advisors could come from someplace else. And you had to do a Minor in some area of computer science. You had an academic advisor in that department. The first academic advisor that I had insisted that I take a compilers course related to my minor. But, I didn’t want to take a compilers course, so I switched my academic advisor! And the other faculty member who I went to was a much more open-ended person, and he said, “Oh, you want to take some courses in Brain and Cognitive Sciences? You can call that your Minor for Computer Science!” It was very flexible, and so I could do very interdisciplinary work.

Poon: Great, I just wanted to go back to the David Marr story. I think it’s such a beautiful story. And it’s so important to recognize that someone took a chance on a student. I think it’s so important because, like you said before, you didn’t really have much experience in his area of expertise, but he believed in you, and it changed your life. He led you into a certain direction that has become

something that you are known for! Edge detection is Ellen Hildreth! So, it was really nice to hear you talk about your mentor, David, and it is a sad that he passed away so early in his life and had so much more to accomplish in his life. But, it is beautiful that his legacy lives on in you and through your colleagues, like Shimon and Tommy. This is such a great story. Has this had any effect on your views on mentorship? Do you believe in taking chances on students? How has it affected you as a professor?

Hildreth: That is one way – taking on students who are very interested and maybe do not have the background, and helping them along the way. Also, I was, particularly as an undergraduate, a very shy person. I didn't speak in class. It wasn't so much a lack of confidence. It's just scary to speak in class, and maybe I was a bit intimidated to speak around people. But, to be honest, at that time, I would welcome the guys answering the questions because God forbid if a faculty member turned to me and asked me a question, I had to answer. So, it was kind of a frightening experience being part of a class discussion for me, partly because I don't think quickly on my feet – particularly if I am in front of a lot of people. I just kind of panicked. But then, as a graduate student, one of the ways in which I think the faculty helped me is that they would put me in situations where I had to speak. I would just be giving a little progress report to the research group or giving a more formal seminar on my research to the A.I. Lab. The faculty were all tied into a wider community where they would run workshops or they would have summer courses, or something like that, and they would invite me to speak. And what helped is that for a lot of these initial

situations, I could plan out ahead of time what I was going to say and I could rehearse it and I could feel comfortable saying something that I had thought about in advance. At least in those contexts, I still had to deal with the questions at the end, but I was forced into these situations and I had to do that. Over a long period of time, I grew more comfortable talking in those types of settings. I still don't feel totally comfortable – for example, standing up in front of Academic Council, which I have to do from time to time. [laughs]. They had a lot of confidence in me to be able to do that. I remember once, Berthold Horn – he was the computer science professor I was talking about – taught a course on computer vision, and what was special about this was that one of the students that I went to high school with, he went to Cal Tech and I went to MIT. Eventually, he came to MIT to do a Masters. After that, he was one of the founders of Microsoft Word – and now he is a millionaire. Anyway, when he came to MIT, he took this computer vision course with Berthold Horn. Berthold had to be out of town one week for a conference, and he asked me when I was just a graduate student to come and lecture to his class in his place. It was special to me because I had this high school classmate, who was a close peer academically to me, and it was nice to be trusted to do something like that and it was also special because there was a special person in the audience. Opportunities like that I think really helped me a lot. And so, as a professor, it is important to see those opportunities for students. It is important to have classes where students have to give presentations, and feel more comfortable in situations like that, because sometimes when I see the

Wellesley students, they can be very quiet and afraid to speak. I can remember myself in that same situation, and so I try to create opportunities for them to be able to participate in class and feel more comfortable and see that confidence grow. I think that is very important. My own experiences with my mentors as a graduate student were important. I didn't have any female mentors as a graduate student. It was a little different when I got onto the faculty because there were a lot of women faculty in the department. As a graduate student, my mentors were men, and they were just very important to me.

Poon: I wanted to go back to what you said about Wellesley students being quiet. I agree with that, and I think it's great that there is such a strong support network at Wellesley because it teaches us how to become leaders. Just small opportunities in class, such as giving a little presentation in class, trains us to become good public speakers and to be in a position of leadership because once we go into the "real world" where there are mostly men working, especially in computer science or the other sciences, it is important to have good composure and eloquence in your speaking. Did you find it difficult in your professional life to voice your opinion because you were a woman, and especially since you mentioned that you were a bit shy?

Hildreth: In some ways, being a woman draws attention to you. I don't think, unless I was just completely oblivious, that people looked over me. If they looked in an audience and I raised my hand, it wasn't as if they were just looking for a guy to take their question. I didn't ever feel that I was somehow overlooked because I was a woman. And, I don't feel like if I said something, then they

would ignore it. And, if a guy said it, then they would pay more attention to him. Maybe that happened occasionally here and there, but in general it was pretty fair. But, others did experience these things. When I was a graduate student, I was part of a large group of women in graduate school in Electrical Engineering and Computer Science. There was a feeling that there were issues in the department of women not being supported, and the occasional sexual harassment, and they put together a report about the lack of equality in the educational environment. In talking with other women students, I was aware of the kinds of experiences that they had. I felt that I could also contribute something about the kinds of things that faculty could do to support women, and so, I was able to contribute those things to the report, and so it had some positive sides that acknowledged some of the good things. So, I was certainly very aware at the time that some women did struggle. I think it varied a lot depending on which research group, and what faculty you were working with.

Poon: So, I just wanted to talk about the single-sex education debate that has come up again in the news recently. There was an article written by USA Today asking, "Is single-sex education still relevant anymore?" I would love to hear your thoughts on it, especially since you come from MIT where there weren't very many women in your class, and then coming to Wellesley as a professor and now the Department Chair of the Computer Science Department. Do you have any insight on this debate and some of the tensions between female alums from MIT and what they think of single-sex education?

Hildreth: I can't speak for others about single-sex education. When I first thought about coming to Wellesley, I was a little naïve. I really didn't know what it was going to be like because I had never experienced anything like it in my life. I was interested in coming here because it was a strong liberal arts undergraduate college – not because it was a women's college per se. At MIT, I was on the faculty in the Brain and Cognitive Sciences department and it was a very supportive department. There were a lot of women faculty in that department. It felt like a very family-oriented place. I had my two sons while I was there on the faculty, but I felt that it was too stressful being in a really high pressure research environment and balancing family and work. It was hard to find the time to really concentrate and focus on research because your life was so much more fragmented. I came to Wellesley in the first place because it was an undergraduate college and I thought I would be a lot happier in that kind of environment. Also, at MIT, Brain and Cognitive Sciences is a nice place if you are really focused on research because the teaching load was very light. I would joint-teach a vision course one semester per year with one or two other faculty, including Tommy and Shimon, and throughout the year I would run a research seminar where different people gave talks. And I had almost no exposure to undergraduate teaching – maybe three or four undergraduates would take my course, and that was about it. I wanted to be much more involved with undergraduates. In some ways, I feel like the biggest difference between Wellesley and MIT has more to do with the differences between being a major research institution and being a liberal arts college.

When I came here, I felt happy here because it was all women - partly because in computer science, women are an underrepresented minority. And another thing about single-sex colleges is that all your students are women, and you can have a greater impact in pushing more women into computer science overall. You don't have to worry about them being turned off by the guys, which happens a lot in high school in particular. A lot of girls have the opportunity to take a computer science course in high school, but the guys are kind of geeky or whatever – either the nature of the course is a bit on the geeky side or the people who do it are kind of intense – and they don't really want to be a part of that environment. But here, I have more of an opportunity to push women into computer science than I would at MIT. Some of the kinds of things you are saying, it is an empowering kind of environment because the women students have to do everything and so they develop a confidence that they can do everything, and the other people doing those things are women, and so they have a lot of women role models. It is 50/50 at the faculty level at Wellesley and you do get a reasonable amount of role models at the faculty level, but your other students are role models too. The more senior students develop a confidence and do interesting things and become role models for the more junior students. The one thing that you have to be careful of as a faculty member is that sometimes, I'm almost too nurturing and hand-holding with the students. I think that it might be because I'm working with women students. And particularly, if they come in and they are very upset and they are very emotional about something, I feel like sometimes I help them a little too much.

Sometimes you really have to be challenged to be able to struggle with something, and understand that you can struggle and that's okay. You have to feel comfortable with that. Sometimes, I feel like we don't push as hard, and we don't force women to be as independent as they need to be. Computer science can be kind of intimidating, and students come into a computer science course already nervous. They may have had bad experiences with computers or whatever, but they don't feel confident. And so, you really want to help them and prop them up. But, sometimes, it's not necessarily the best thing for them, and I worry that we don't push them hard enough.

Poon: I think that is a great point, especially going back to what you said about MIT and the advice you gave from your undergrad experience. You are going to struggle, even though you think that you're so smart, but it's a learning process, and part of that is learning how to fail and how to pick yourself up from that. I hear what you are saying about how some women come into computer science already intimidated and unsure, and I think that's a reflection of society and what it thinks about women and technology. There is that stereotype that women cannot handle machinery or technology. And so, I think that this computer science department – which is by far the most friendly department at Wellesley in my experience – tries to counteract those negative stereotypes by being nurturing. But, at the same time, you are right, I think students need to learn how to fail or at least struggle a bit and learn how to come out of it by themselves. That is an important skill.

Hildreth: Yes, and to be comfortable with learning new technical things on your own because any program environment that you use is massive and there is only a small amount that we can cover in a short semester. Also, technology is constantly changing. Whatever you learn now is going to be completely different five years down the road from now, and you have to have the confidence to be able to just go and figure it out on your own. And I'm always so impressed when students talk about their summer internships that they have. We have this Senior Seminar Series, and sometimes in the fall, the seniors will give talks on what they have done. They will talk about going into a new environment where they had to learn something like SML and would then rattle off things that I've never even heard of! And they said that they didn't know anything about it and their supervisor just dropped the manual on my desk and that was it! But, they got through it and they learned so much from the experience of having to figure out everything themselves. I think it would be nice if we could do more in our courses to help students appreciate that. But, there is always this little fear that it will come back and haunt you because they will complain about you on their SEQs (Wellesley's student evaluation questionnaires), but it is a kind of experience that is good in a field that is constantly changing. You have got to be confident in your ability to be able to figure out whatever you need to know. I think guys are a little bit more comfortable, but maybe they aren't, and they just don't show it as much as women. I don't know what it is. That is somewhat of a drawback of being in a

women's institution, that you have to be careful of as a faculty member. You have to be able to develop that kind of confidence.

Poon: Interesting. Let's talk about your professional life and balancing a family. You mentioned that you had two sons. Was there ever any difficulty with that? Were there any gender expectations for you to fulfill after graduation? Was it expected for you to go into the working world immediately?

Hildreth: I was a research scientist for a while and that is common in my field – and certainly very common for people at MIT, even the best people coming out of MIT would go into a research scientist position for a couple of years, and then get a faculty position. So I was a research scientist in the A.I. Lab, and during that time, Tommy Poggio who was then on the faculty in Brain and Cognitive Sciences wanted to start up a new interdisciplinary center called the Center for Biological Information Processing. It would be housed in the MIT Whitaker College of Health Sciences and Technology – where a lot of the neuroscience people did their research. So, he wanted to build this center, and I was a fresh Ph.D., but he asked me to help with the administrative work and really get this going. I was from the beginning an associate director, and eventually a co-director. I really helped to get that started. It was a place where we would have visiting scientists come and it was very interdisciplinary with computer science and biological science working together. We had to submit lots of proposals for grants, and so I got a lot of that kind of experience. Because of where I was, I was exposed to a lot of the Brain and Cognitive Science faculty, and then after about three years, I joined the Brain and Cognitive Science

faculty there. In terms of balancing family, my husband is Eric Grimson who is now the MIT Chancellor, but at the time, he was a couple years ahead of me. He was also in David Marr's research group, and was one of David's first Ph.D. students – maybe his second Ph.D. student. We were married when I was a graduate student in my last year of graduate school. We were both in the same research group. Even when I joined the faculty, there was an expectation that I would probably take time off for family at some point. I had my two kids when I was on the faculty there. In fact, I remember this kind of funny situation, when I had my second son, he was born a month early. But grant deadlines don't move because you are having a baby! [laughs]. I remember that some issues arose and I had to spend some time in the MIT infirmary which is connected to the building where our center was and where I was teaching a course. So, I was in the infirmary, but I knew I had to give this lecture. I knew I didn't have to walk that far away, so I pleaded with the doctor to let me go out and give this lecture. And so, I went to class and I had to come right back, and while I was giving this class, I was wearing the little plastic hospital ID bracelet because I was still a patient! [laughter]. And then, I had to go to the hospital and the baby was delivered early. I remember sitting in the hospital bed, finishing up this grant that had a deadline of a couple days later. The baby was born early, but I had to help with this grant. And so, you can never really get away from your work when you have a family! It was hard. It certainly wasn't anything that the Brain and Cognitive Science Department did that made it difficult for me. It is simply hard. I remember

there was a time before my time on the faculty at MIT when women felt like they had to make more sacrifices in some way. You had to sacrifice family if you were going to have a career at MIT. I was part of a discussion group of graduate students and women faculty that talked about family and work issues. There was a woman from the Biology Department which in those days had quite a lot of women – maybe an unusual number of women in terms of departments at MIT in those days. She had commented that there were a lot of women in the Biology Department and then she thought for a moment, and said, “And between us, we have one child.” And I was just stunned by that. So, there were definitely those who felt that for the sake of their work they had to sacrifice family. At the same time, there were a lot of women who had just taken a very different path. They didn’t just do their Ph.D. and maybe post-doc and then move onto the faculty, and walk up the faculty ranks at the same pace as the men would do. There were very few women who had done that traditional route. There were some who had gone off and had their families. Maybe they had gone through graduate school, but then they took some time off and had a family, and then came back to their careers later or they got themselves into a faculty position, but then took time off, or maybe worked for an industry research lab for a while where they had more flexibility before coming back and doing their academics. They found ways to put these two things together, and that was very reassuring to see a lot of that. It was rare to see someone who had just gone through the ranks as the men would, but at the same time, it was okay to do something different. So, that made me feel better.

In the end, I had to juggle lots of things, and I was a very methodic person. I needed time to get into my research and time to focus, and I just really didn't have that anymore. I remember once when I was pregnant with my first child, I was at a conference and one of the senior women I was talking to about what it was going to be like after the baby was born. And she told me that after you have a family that you are going to find that there are five hours in every day that you used to have to yourself to do what you need to do that you will no longer have. When I heard it put in that number, it was shocking to me, but she was absolutely dead-on! When you think about it in terms of those numbers, you just can't do everything that you wanted to do in your work and have the family too. My husband was very encouraging and incredibly supportive and helpful at home. He always did the dishes or whatever. But still it's more time-consuming for the mother than the father, no matter how supportive they are. It is a hard thing no matter what, but you have to feel comfortable that you can make different decisions about your path. Maybe you can't do that intense laboratory work that requires you to be in the lab 24/7 like the biology women at MIT. Maybe you are going to have to compromise a little bit in the work that you do. Or maybe you can find a more flexible kind of environment. Or if you are going into industry, you can find a place where you can do a time-share with another person to cover your position. You can look for that flexibility and feel that it doesn't mean that you are any less serious about your profession, but these things are okay. You do what you need to do to try to do the best with both. I'm actually in a half-time position

and I have been since 2000 – since my older son hit 6th grade. It's not that things became more time-consuming, but it's that my children needed more of my intellectual energy. It becomes more demanding as the kids get older. I just felt that I couldn't juggle a full-time position, but that has been perfectly okay at Wellesley. I don't know if that's a common thing at MIT, but at Wellesley I could be in a half-time position and that was okay. I think it helps that this was post tenure. I think that would be a hard thing for someone to do earlier.

Poon: Wow, so much great advice! Thanks so much for sharing! So, just to wrap things up, do you keep in touch with anyone from MIT? You said that your husband is the Chancellor there now, so I'm sure you have to go to some of his events. It must be fun to visit from time to time.

Hildreth: Yes, it is actually really nice. I don't so much see women students, but I might see them at conferences. There was a woman that I interacted with while I was an undergraduate who I lost touch with for a long time, and then her family moved into the same town and she had kids the same age as my kids and we would bump into each other at school events. I don't keep in touch with other students that I was with, but I do from time to time see the faculty that were in my majors. I see more of MIT these days because I do go for different events and it's good to reconnect.

Poon: Do you think that MIT has changed a lot since your time there?

Hildreth: I think it was a little more focused on its science and engineering disciplines when I first started. I would say there are a lot more big centers at MIT – the

cancer center, the energy center, the technology center, the policy center.

There are more interdisciplinary kinds of centers, and the Brain and Cognitive Science was an interdisciplinary kind of department. Many more things just focus on bigger problems, and an appreciation of the broader range of perspective that has to go into those problems. Not just the technical science and engineering, but the policy, the sociology, the medical, and other broader perspectives. Also, not only more inclusive of other broader perspectives, but also more women involved and minorities involved. Some of the perspectives that they are bringing are ones that women tend to go into more and more often. And I see it as more of an integrating sort of place.

Poon: Ok, well, thanks so much for doing this! I really enjoyed listening to all your stories and advice! It was truly a pleasure!

Hildreth: Thank you!