The people with whom I want to work:

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:: Facilitation of Emotional Communication ::

I am interested in human emotional communication; that is, one-to-one or one-to-few communication whose purpose is to convey emotions.

I would like to give some background first about why I am interested in this topic.

:: Disabled Sibling ::

My sister Robin was stricken with a rare developmental neurological disorder called Rett Syndrome. It affects only girls and leads to severe mental and physical retardation. Most girls do not live past adolescence. Girls like Robin often make stereotypical hand motions, display autistic behaviours, and are unable to communicate with language.

Even though she was unable to speak, Robin was able to communicate through her face, especially her eyes. One look and you knew whether she was happy or not; you could see if she was going to cooperate with her physical therapy; you could see her appreciation at being placed in her favourite bean-bag chair. While it is a cliche, by looking in her eyes you could see right into her mind.

Communication with family members through eye contact is sufficient when everybody is living at home, but what happens later in life when siblings leave home for college, when they leave to start their own lives? How does a sibling keep in contact with his or her disabled brother/sister, especially when the communication is so tied to being able to see the other person's face? This is a severe hole in current facilitating technologies for disabled people.

Yet one could imagine solutions. Even as long as ten years ago we investigated _facilitated communication_ for Robin. Not much more than a series of buttons to press or knobs to turn, facilitated communication was an attempt to allow Robin to communicate non-verbally. A recent project of mine, although not specifically designed for this purpose, could be used for facilitated communication: amia [1] is a device to help with remote emotional communication between couples. A major part of the device is communicating through the pushing of actuators: a push on one device causes the corresponding actuator on the corresponding device to pop-out. You could image a large number of these actuators forming a device that could encode an entire hand and could thus be used as an alternative form of communication for those with the necessary motor skills.

While Robin passed away over ten years ago, there are still thousands of other people who are faced with similar situations. If there is some way for my work in graduate school to help with this problem I would feel like I had helped improve the lives of some people.

:: Strong Evidence for the Plasticity of the Brain ::

I have recently been involved with a research project that looked at how low-level brain areas involved in visual perception change when there is a lack of visual input, such as in the case of people with macular degeneration (MD). In the subjects we examined, the damage caused by MD was to the central portion of the retina (called the fovea). One of the main findings is that areas of the brain that are usually wired to respond to stimuli presented at the fovea instead responded to stimuli presented to peripheral portions of the retina.

This is a dramatic reorganization of the cortex and has important scientific and clinical implications. At a higher level, however, it suggests something deeper: the brain is much more plastic than we once expected. This plasticity could potentially be used to the advantage of those designing new communication devices. It might be possible, with enough experience, to completely re-train portions of the brain to respond to novel inputs and thus to enable people who have problems with linguistic communication to communicate in other ways. For example, there is a case of deaf Nicaraguan children creating their own sign language spontaneously when placed together [2].

:: How Attending the Media Lab will Help Accomplish these Goals ::

While I have focused mainly on the scientific questions of emotional communication, I want to address an aspect that is often overlooked in the wider scientific community: that of aesthetics. This is where the Media Lab becomes the best place for graduate study.

Too often researchers in human-computer interaction (HCI) focus on the functionality of the device and leave the visual as an afterthought. However, intuition, as well as empirical research, shows that aesthetics are just as important to the success of a device or object as the functionality is. The Media Lab's embracing of the twin pillars of aesthetics and functionality is incredibly enticing and is what draws me to apply for graduate study. I believe the close ties to the Architecture Department and the Harvard Design School, as well as all of the myriad of research taking place at MIT, makes the Media Lab an ideal place to study and work on problems such as human emotional communication, problems are are by their very nature multi-disciplinary.

I was fortunate enough to get a glimpse of the life of a Media Lab student this fall as a participant in Hiroshi Ishii's course on Tangible User Interfaces, MAS.863. This

course was incredibly rewarding, as simple things like in-class design exercises forced me to think (quickly) of utilitarian but aesthetically pleasing solutions to common HCI problems. The two class projects, of which amia [1] was one, provided a deep and intense means of fleshing out my ideas regarding emotional communication. Discussions with other participants, not only my group members, but class members as a whole, TAs, and Professor Ishii himself, provided enlightening insights into aspects of the problems that I had not even considered.

This window onto life as a Media Lab student showed me that indeed, the Media Lab is the best place for me to explore solutions to the problems of emotional communication I stated above.

:: The Future, or What I Would Like to Do After Graduate School ::

Graduate school is only the beginning, of course. While I understand that I initially apply to the Media Lab as a master's student, I currently would like to continue on to get a doctoral degree, eventually getting a faculty position at a university or starting my own design and consulting firm. The reason for the master's degree is almost self-evident: I want to explore, in an incredibly intense setting, HCI in general and emotional communication specifically. A doctoral degree, in addition, would allow me to share my insights and experiences with others, to teach people the importance of not only proper functionality, but good design and aesthetics as well.

:: In Summary ::

My experiences provide me with a combination that I believe is specially suited to the Media Lab. I have a strong grounding in cognitive science, which informs so much of human-computer interaction research. My personal experiences gave me first-hand knowledge in the difficulties of emotional communication. My outside interests, as shown through my portfolio [3], indicate that I am quite interested in art and design.

The Media Lab is at the forefront of the intersection of science, engineering, art, and design; my interests lie there as well.

:: Notes ::

1. http://zeitkunst.org/amia

2. Senghas A., Kita S., and Ozyurek, A. “Children Creating Core Properties of Language: Evidence from an Emerging Sign Language in Nicaragua.” Science, 305, 1779-1782

3. http://www.mimeme.net/portfolio/