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CityHome User Interface and Experience

The basic structure and layout of our homes has been essentially unchanged for the past 150 years, failing to keep up with technological innovation. Architects have also failed to solve the problems of rising rents and increased space requirements that afflict young urban professionals. The CityHome project in the Changing Places group of the Media Lab aims to develop a ‘smart,’ modular living space that can electronically transform itself into multifarious configurations. A 640sqft apartment could turn into two bedrooms, a dining room for 12, or a spacious office. This is made possible by adding mechatronics into each piece of furniture and each wall, and controlling their arrangement using a computer system that responds to the needs of the resident.

As a student of Course 6, and considering my experience in backend web development and my interest in learning more about hardware, I will be focused on building the system that users will interact with to control their CityHome. I will be working on user interface (UI) and user experience (UX), exploring new interaction models best suited for this project. Most exciting to me is creating a UI with floor-facing projectors embedded into the ceiling that would display on the floor layouts that the user could select. Combined with 3D imaging from devices like the Kinect, the user could interact with these projections on the ground, building his layout in his real space. Another possibility - instead of users having to build their own layout for each situation, an algorithm could build layouts in real time based on priorities that the user provides.

Beyond these ‘inward’ looking elements of the project, which aim to make control the system simple, natural, and powerful, there are thrilling possibilities for integration of external systems into the project. For example, the apartment could automatically reconfigure itself based on the resident’s electronic calendar, or could use its walls as a digital photo frame. Since the apartment is ‘aware’ of weather and time, it could automatically present seasonal clothes and items to the resident. Robotic vacuum cleaning solutions would be even more effective, as all the furniture could be moved automatically for cleaning.

By the Media Lab’s Fall demo day, I plan to have the ‘backend of the frontend’ interactive, if only through a non-interactive page. This would also be ready for development of ‘plugins’ or ‘apps,’ that would allow external systems to interact with the CityHome. By the end of the term, I plan to have a basic interactive web interface (built on HTML5 and Javascript) useable, and ready to be implemented with the overhead projector interface. In future terms I would complete the implementation of several plugins, such as the digital calendar plugin. I will be working with Hasier Larrea-Tamayo, a PhD student, garnering feedback from him about the interaction models and the UI/UX of the project.

Before I came to MIT, I had heard about the amazing projects from the Media Lab. I was amazed to see how people brought into existence prototypes of the most “pie in the sky” ideas. The Sixth Sense project and the Bokode (enhanced barcode) project made me realize just how ambitious and capable MIT engineers are. Since then, I’ve wanted to take part in a project where I could learn as much as I contribute. I’ve long loved to work on my personal electronics and programming projects, finding them more interesting than my schoolwork, and this position excites me in the very same way. Having held a physics research assistant position that I found interesting but not gripping, I also want to use this opportunity to see if I should explore academia instead of industry positions in the future.