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Toward an architecture of mind



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Abstract: Today's technologies offer a new class of symbol, one that—while not material—has a presence bordering on the tangible. Virtual reality, computer modelling and video games exemplify this class, challenging our conventions of fiction and reality. They call for a reassessment of symbols in many disciplines—particularly in the fields of architecture and design. Despite their service to our material world, these disciplines—architecture in particular—rarely engage it directly. Their practitioners deal almost exclusively with symbols (drawings, models, specifications) that mediate intentions to manufacturers and clients.

With the advent of computer-aided design, these symbols have curiously become more palpable as well as more abstract. More abstract because they are manifestations of data, yet more palpable in their engaging presentation. The design professions clearly benefit from these new symbols as near-tangibility can compete with the designer's product. Paradoxically, if the symbols become as "real" as the product, fabrication becomes redundant.

This paradox requires designers to redefine objects and space as informational entities that are closely linked with our physical being. This assessment includes the things we sense directly or through our extremities, and those that we imagine or dream of. Only through this reassessment can designers better understand their disciplines and the changes brought on by their tools. This presentation will address this resolution. In particular, the author will present the concept of cybrids—hybrids of physical and cyberspaces—as entities that could not exist without reconciling the new class of symbols with the materiality they convey.

I want to thank our host for having done such a wonderful job in organising this event. It's a great pleasure to be back in Barcelona. I've been here several times before, but it just keeps unfolding for me. It is a beautiful city, filled with wonderful, hospitable people.

My name is Peter Anders. I'm based in the United States. I've been part of the Star Program for the past few years in pursuit of my PhD. My own area of interest is architecture—at least that is the basis from which my research stems. I got into the area of computing and architecture fairly early on. My firm in Manhattan was among the first to actually use microcomputers for the design of buildings and as part of the working methodology of the practice. And, in my other life, I was also teaching in architectural programs which were beginning to recognise the virtues of working with digital media in education.

I had an interesting experience, however—interesting is perhaps the nicest way to put it. In the early 90s, some ten years ago, when I was based in Manhattan, there was a major economic crisis and everything seemed to slow down. My office was loaded to the gills with computer

technology, everybody was all set to go ahead and work on projects, but there were no projects forthcoming. And I had this sinking sensation that there I was all set to go, and basically had this very powerful car to drive and no place to drive it to. And this story developed in my mind as a way to explain my situation as a metaphor.

Imagine that an architect such as myself was all set to do work with his computer equipment, his staff in place, and the only project to come in the door was a library—and this is a point of departure for many of my discussions with people on this—, and a client walks in and says: "We don't have the funding for this project yet, but we do have a lot of interest and we have a lot of motivation to get this small municipal library built". And the architect is very excited about this, because it is a big opportunity for him, and there is no other work to compete for his attention.

So he begins with sketches, begins working with the computer, begins to build models, and so forth. And the client says, "This is wonderful. This is great. We have just enough money to proceed with some of the renderings that we are going to need to have in order to sell this to future benefactors and other people that will fund the project". And the architect, of course, has had nothing to complete for a time, and goes ahead and does some beautiful renderings. In the course of doing these, he comes up with increasingly sophisticated cut models that begin to resemble the final product. I mean, for instance, you can do not only beautiful drawings of this, but you can also do walkthroughs, you can also see what the building looks like from different angles, but it's all digital, it's all information.

The client loves it. "Take me on a walkthrough, let me fly through your space". You can look at it on the screen—it's all there. And in fact the architect has taken a couple steps beyond this because the client has held up further money for the time being. It doesn't stop the enthusiastic architect from beginning to explore with a virtual reality model—what it is like to walk through the aisles of the library, reach out for a book that might be on the shelves, open the book, read the pages. This is all above the copyright laws, of course!

And the reality of the library becomes autonomous, it becomes its own entity. And the end of the story, of course, is that the client never did get the funding to build the physical building. And the architect in his frustration, who now has this huge database with all this information, these books and the full experience of moving through a library, decides to put the whole file on to the Internet, so that suddenly the library that was originally designed for a small municipality is available to the rest of the world.

The question in my mind at that point when I came up with that story was "Well, in what way should I best spend my time as an architect? Should I sit around and wait for someone to come along and tell me to build the physical building, or is it possible for me to use the same tools that project buildings to actually create the environments that are the end product of the conventional architect?" And that was really the starting point, the little narrative that I tell myself when I wake up in the morning and say "Oh my God, I've got to continue my research and my PhD" because, deep down inside, this has driven a lot of the work I've done since that time.

I'm going to talk a bit about how architecture is affected by this line of thinking, and where this line of thinking might lead us. There are three areas that I would like to discuss: defining space from a cognitive standpoint, that is, when we deal with symbols as though they were the real thing; cyberspace as an architecture; and what I call cybrids, which are combinations of physical and symbolic or electronic digital images.

There is a set of diagrams that I'm going to go through now to introduce this issue of space as not being something that is necessarily external to us, but actually something that we are involved in creating from one moment to the next. If we are to accept that it is possible for virtual reality to supplant physical reality, as I posed in the previous anecdote, then we might take a look at what it means where the disparity between virtual and physical worlds comes into play. There is—as I said—a brief philosophical discourse here, but bear with me for a moment.

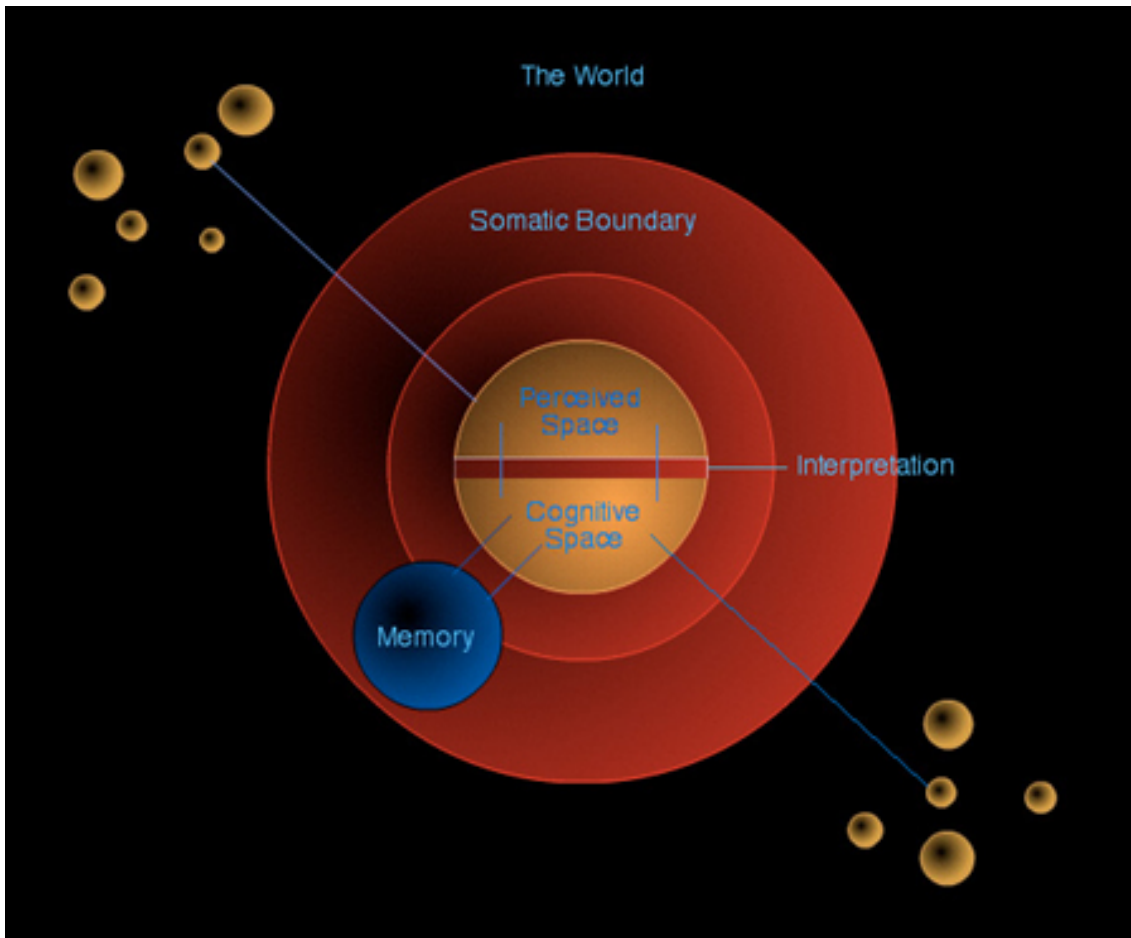


Image 1

In image 1 we can see a diagram that shows a personal identity and an exterior world full of information, in this case objects that are not immediately perceivable until information from the outside world actually reaches us. We have a somatic boundary, which is the limit of our senses, and eventually some of the information from the outside actually makes it in and begins to bear on our bodily processes and finally our cognitive processes. And then there is a set, a network if you like, of interpretations that this information goes through as it makes its way toward our consciousness. And what I would argue is that in response to this stimulus we create different kinds of space.

I can look around this room right now, for instance, and pick out all of the people that are wearing black shirts, and suddenly I'll be able to single out those people that might be involved in certain types of activities, and so forth. Or I can single out all the red objects in the room, and that is a way of my mapping space, my way of mapping that kind of information. I can't be sure that, aside from that, that space really exists; it's largely a product of sensory input that is being made sense of by my mind. Memory plays a role in this as well, and one could argue loosely that the process is reversed when we are engaged in creative activity. Where we imagine something mentally in this space—I close my eyes, I have a dream, I'm in a discussion—something comes out of this spatially and is then evoked into a physical environment as more artefacts, more writing, more buildings, more sculpture, more art.

We are involved in the creation of the outside world, and there is a sort of a holistic backtrack to this. But if we were to argue that there is this world that is beyond our senses, we can have access to that world through direct sensory perception, but we can also have it through another, what I call extended set of senses, which include telescopes, microscopes and all those tools that we use to project ourselves out into the world and reciprocally sense something that is

beyond normal perception. And when I say mediated entities (see Image 2), I could also say that that might be digital information that's passed over the Internet as an extended form of sense and then interpreted by my computer on a screen so that my eyes can understand, or my eyes can take in the information and process it from there.

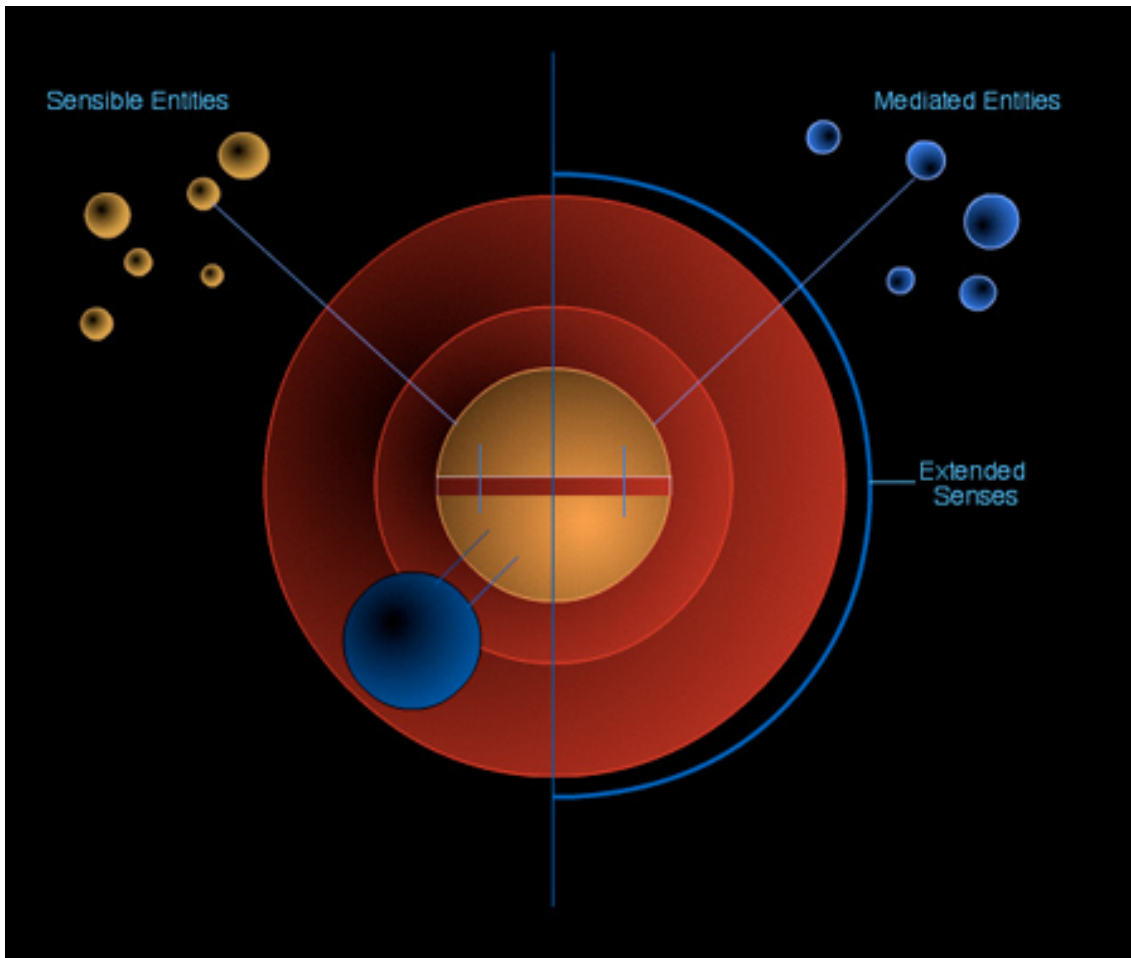


Image 2

I don't wish to dwell on that much further, but the area of my enquiry right now is this boundary between mediated entities and those that we sense directly. In the little parable that I mentioned earlier about the library, saying "It might just be possible that a library no longer needs to be physical" was taking the argument to an extreme. But I think that what we are going to see increasingly is a blurring of distinctions between what needs to be physical and what doesn't. The previous two presentations had beautifully illustrated examples of where the physical still needs to be there. I still need to be in this room talking to you, because experiencing you all—and, I hope, experiencing me—directly is quite an improvement on, and quite distinct from, a mediated situation. But as has been pointed out by the director, there are times when other forms of communication are best. So Universities in that sort of case become something that I would call a site for a cybrid, or a hybrid between mediated entities and physical ones.

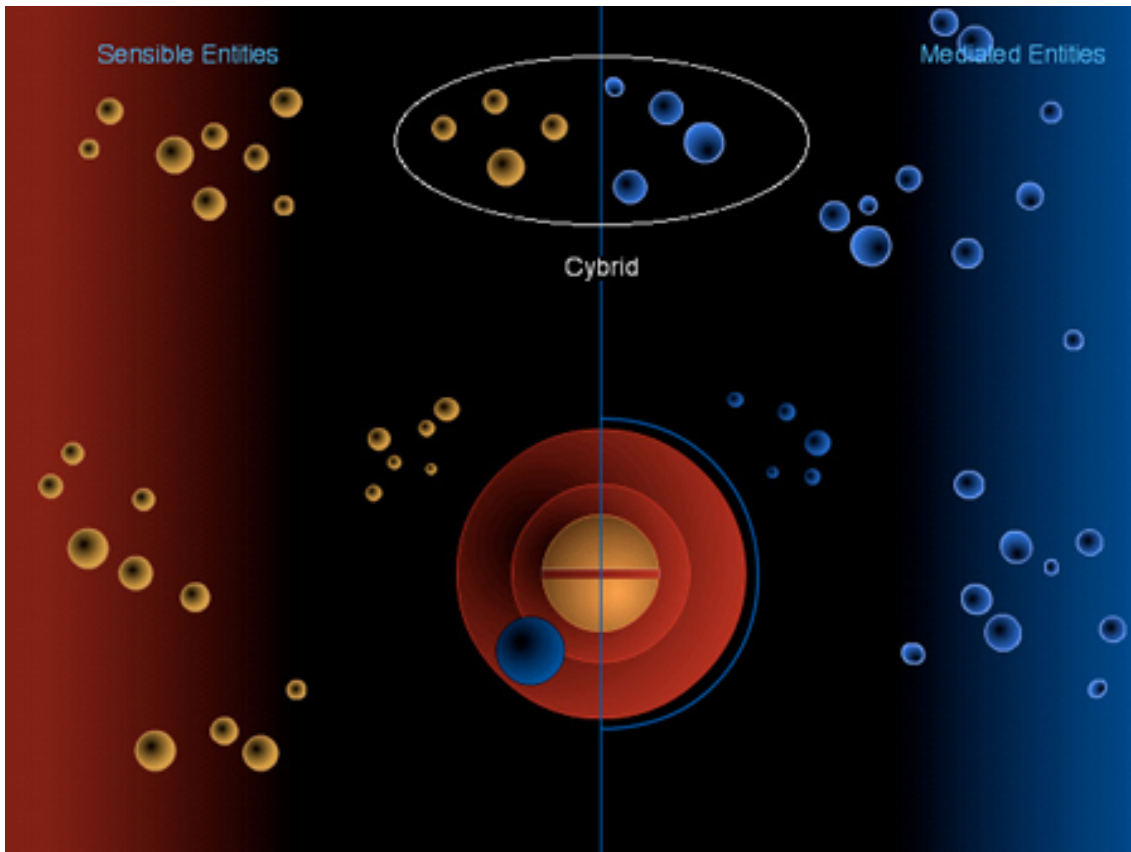


Image 3

And I could go on to point out different examples of how this works, but very briefly I would just like to talk about how architecture itself becomes sublimated by this concept of information. I was asked to design an electronic network for a company a few years ago, and part of my consultancy work was to describe it to people who were not, I would say, technologically literate and certainly didn't know very much about the way in which an information system for an office might work, or how information passed around within their office structure. And I used the analogy between the physical space that they were in and the kind of communication that was happening between the components of the company—administration to sales, sales to administrative support, remote distributors, the warehouse at the back and so forth—to reinterpret their physical environment as an information environment, and then make a sort of flip-flop over into what an electronic domain might be.

And as the discussion proceeded, the diagrams became more and more abstract, but always referring back to the metaphor between internal operations and external. And with this doorway here set into a wall, representing firewalls in an electronic environment, the metaphors that travel back and forth between architecture and electronics and computing, are a source of amusement for me and certainly of speculation.

Once again this is a metaphor. We use metaphors all the time in order for us to handle information to communicate with each other, but also to keep things straight. The desktop metaphor that we often use with computers is a perfect example. In this case software, as I've shown here, can be represented by filing cabinets and their spatial distribution.

Space is a product of thought, space helps us think, so it sort of feeds itself. And in the course of working with a client I came up with a tool which is really a mock-up in which you might be able to use spatial reference to help organize thoughts.

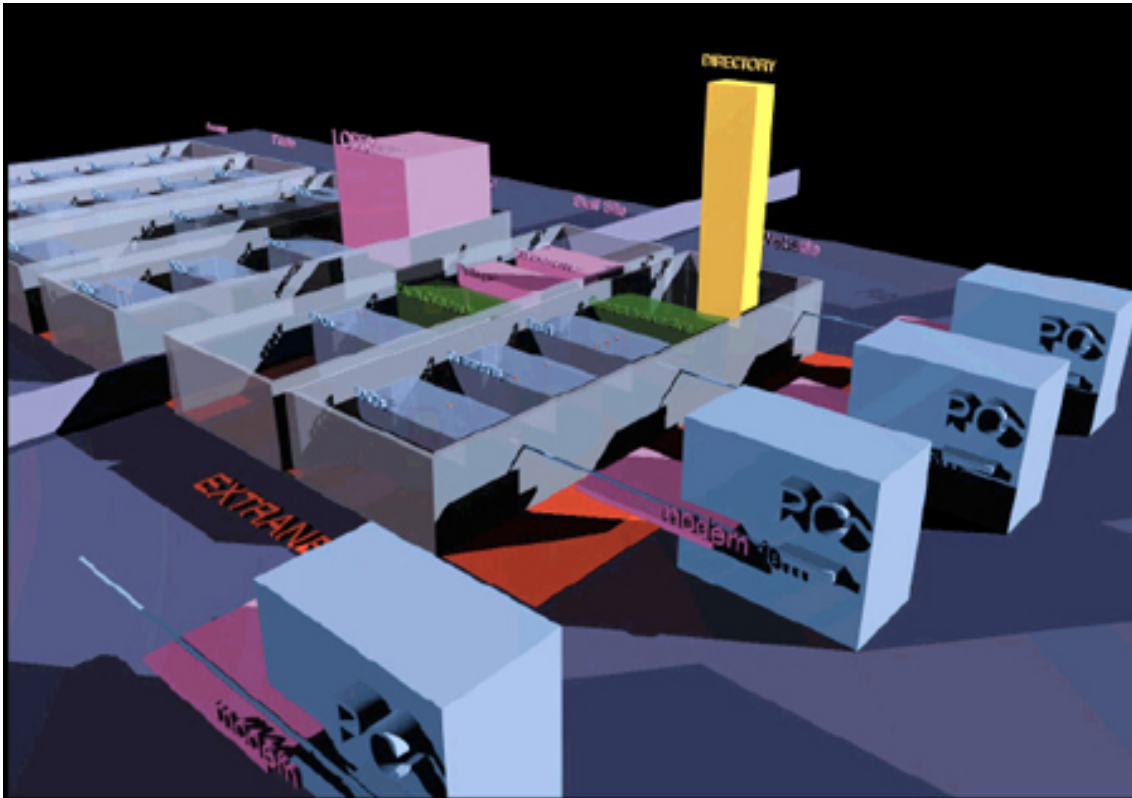


Image 4

Talking with the client you could say "Well, this component here represents a division of activity within the company, these subcomponents here are the portions of the activity that need to be worked on and different things fit into different slots. So you might be able to map out the activities of a corporation, in this way some things apply, other things don't".

This was just an example of creating a little toy that you could talk about with people, an interactive diagram to help them understand the complexity of things. If we take another step further, this kind of simple diagram could actually become a vastly complex one from which one could derive websites that support the company, but one could also derive a physical architecture that could be printed out, so to speak, in different forms—and whether it is a graphic image like this or a building makes no difference. The reality of the database that generated it, which was a product of the decision-making, now gets printed out as buildings, as drawings, as models, and so forth. So that's the kind of connection between space as a tool for thought and the space of architecture which is often projective, and—as I have argued elsewhere—how those two can begin to work together is imperative for setting out agendas for construction.

I'm going to hurry through this, because I'm going to run short of time if I don't. This is actually more of a discussion on the process of architecture and the way in which architecture has always relied on negotiation between information entities and physical entities. Very briefly, the architect and the client begin with a physical site, then information is generated from the site visits, then that information is brought to a physical state through sketches and notes, and then from there we have further discussions with clients and engineers, which generate information that is printed out in renderings.

My point is that the interrelationship between the physical and the symbolic or informational is a natural part of the architectural process. It happens through time. What happens when we start to think of the informational process as spatial and being in direct relationship with the physical? In a given project, they coexist in a spatial fashion, not just as part of the process, but actually as the end, whatever that end might be.

I would argue that architects have to stop thinking about buildings as the end point of their work. Typically the architect generates symbols, the symbols are transmitted to agents, whether it is a contractor or maybe in the future robots, and the architect says "That's it. That's the end of the project". But it's not, because as soon as the building is occupied, as soon as people begin using it, making modifications, the project lives on and on, until documents have to be generated for demolition, archives are created for reference. This is an ongoing, swinging back and forth between physical objects and informational objects, and if we begin to think of the cybrid as being a hybrid space, a hybrid of spaces that are physical and symbolic, or notational as it has been called, we can imagine a hybrid reality or a cybrid reality in which someone who is suitably equipped to view this world would say "I have a physical object here that notes my handling of it and displays its contents to me in this way". So this person here happens to have a small object, he can view it and he can view information about it, all as part of a totality. So in this case this entire thing here is the cybrid which can be viewed perhaps through a VR headset.

Another example would be how environments would be affected by this thinking. In image 5 we have an architect with her engineers, perhaps a client viewing a project which is partially physical, partially virtual.

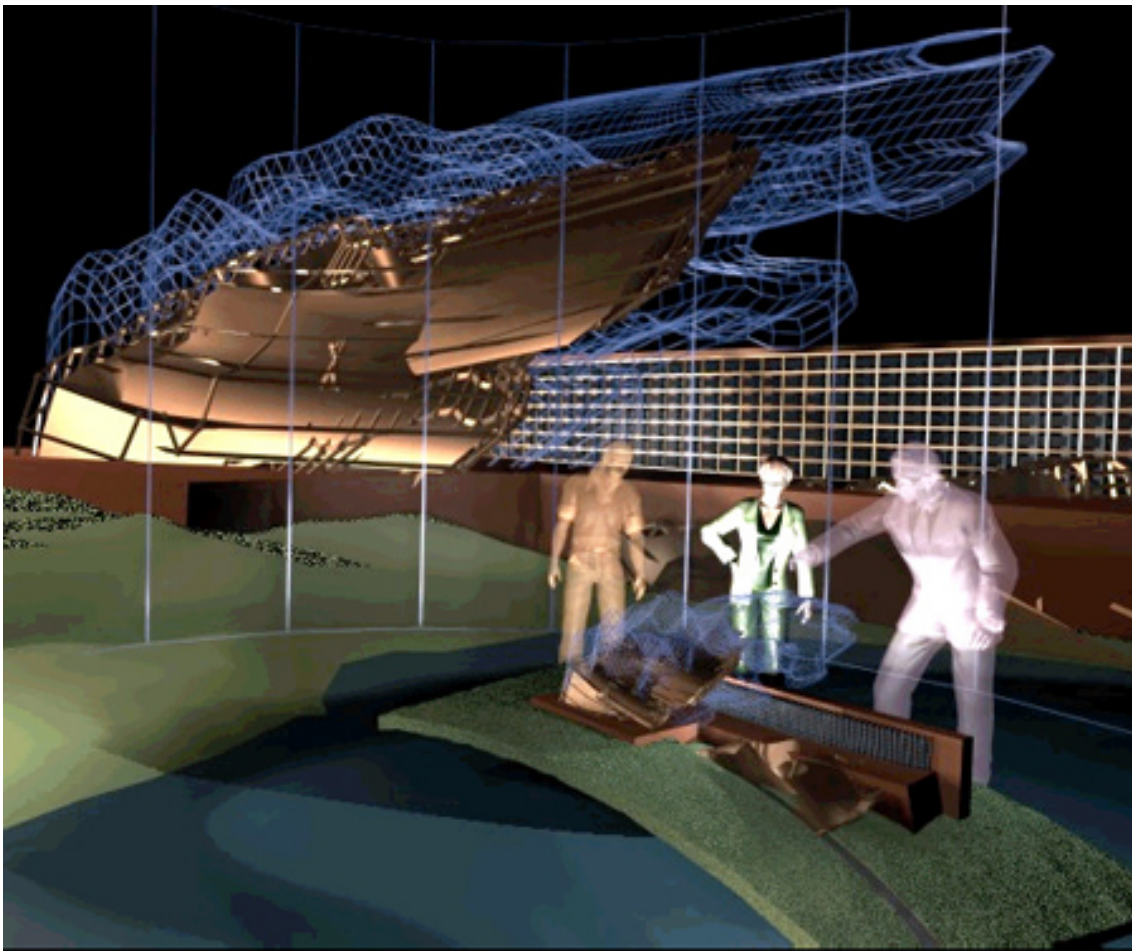


Image 5

They are virtually situated within the same space, so to speak, the same cognitive space as the model and the architect. We can see an animation here. The merging between the physical and the electronic is as seamless as possible.

The cybrid hypothesis works on a number of different levels, all of which I would argue are part of architecture. There is space that is inhabited, there is space that is perceived, and there are

the objects and the people that inhabit it. So the people that we see here engaged in discussion are passing information between each other, they are also negotiating a physical entity in front of them, and then, on top of that, there are observers on the outside who have their own systems of notation. Viewing this world through their headsets and not being only able to see what is going on here, they can see the consequences of decisions at a smaller level happening at the larger physical one outside. Outside it doesn't exist *per se*. Outside it's experienced perhaps through a set of devices or displays that let you experience the larger configuration of the project in full scale, but without physical consequence.

I think with that I can probably close. But I did want to tell you that my research has not only been in the area of theory and in speculative animations, which is what you've seen here. I've actually been trying to build things that demonstrate the principles that I'm after. One of the concerns that I have is that we don't end up with a misunderstanding that a cybrid is simply like a screen on the wall which the information is projected on to and has no consequence on the physical screen, nor does the screen directly *per se* have much impact on the information. There is a close connection between the physical and the non-physical spaces. And to that end I've been doing work on a device that is something of a metaphor for the way in which a cybrid might work best.

The devices I made are actually two identical robots, they are small robots both equipped with sensors and both equipped with step motor actuators, so when you manipulate one it sends signals and information to the other, and vice versa. So if I turn a wheel on one it has an effect on the other. In a cybrid situation one of those would be virtual, but this is—as I said—somewhat of a metaphor for how the cybrid might actually operate.

In order to demonstrate my cybrid idea, I created a model that led to the construction of another robot. The robot and the model resemble each other, in most important details not just the wheel, and the idea is that the connection between the physical object and the symbolic object is as tight as possible, so that when I turn the wheel on the symbolic component here, it has an effect on the physical, and conversely, when I change something, I turn the wheel on the physical one, it has an effect on the symbolic component.

Cybrids are more than simply a complete separation. Between these two we can actually have shared component. My idea is that you might have a physical object that has a symbolic component, and that could maybe be controlled, and then a remote cybrid, that is also partly symbolic and physical, that will respond to a stimulus and input from the other—and vice versa, of course.

So with that little demonstration we begin to see that we might not only have a virtual and a physical world that correspond with each other, but the entities themselves that comprise their world might be cybridize within that world.

So I think that with that I would like to close. I think we have a couple of minutes for questions and answers and I'd be happy to clarify anything, if you like.

Thank you very much.

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- ⇒ MINDSPACE:
<http://mindspace.net>
- ⇒ Saginaw Valley State University:
<http://www.svsu.edu>

Partners:



<http://www.caiia-star.net>

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