Media-Space&Place

Being there

approaching desired spaces and places

- /..1_<u>Heidegger: Being-There</u>
- /..2_ Your wish is my command
- /..3_ Facing a remote control future?
- /..4_ The Telepresence Garment
- /..5 How to be a 24-hour, 3-D marketer
- /..6_ <u>There is no simulation like home</u>
- /..7_ Just Being There
- /..8_<u>VR Therapy for Spider Ph</u>

1.1. Being-There (or Nothing)

Heidegger

German philosopher *Martin Heidegger* employed the methods of <u>phenomenology</u> in pursuit of more comprehensive <u>metaphysical</u> goals. In Heidegger's full-fledged <u>existentialism</u>, the primary task of philosophy is to understand Being itself, not merely our knowledge of it. In the lecture, "What is Metaphysics?" Heidegger developed several of his themes in

characteristically cumbersome language. The best way to exhibit the subject-matter of first philosophy is to pursue one actual metaphysical question; since all of them are inter-connected, each inevitably leads us into all of the others. Although traditional learning focusses on what is, Heidegger noted, it may be far more illuminating to examine the boundaries of ordinary knowledge by trying to study what is not.

What is Nothing, anyway?

It's not anything, and it's not something, yet it isn't the negation of something, either. Traditional logic is no help, since it merely regards all negation as derivative from something positive. So, Heidegger proposed, we must abandon logic in order to explore the character of Nothing as the background out of which everything emerges.

Carefully contemplating Nothing in itself, we begin to notice the importance and vitality of our own moods. Above all else, Nothing is what produces in us a feeling of dread {Ger. <u>Angst</u>}. This deep feeling of dread, Heidegger held, is the most fundamental human clue to the nature and reality of Nothing.

Human Life as Being-There

Human beings truly exist, yet our "being-there" {Ger. *Dasein*} is subject to a systematic, radical uncertainty. Because we know that we will die, concern with our annihilation is an ever-present feature of human experience: Death is the key to Life. The only genuine question is why we are at all. Once we experience the joy[!?!] of dread, we recognize that our lives are limited—and therefore shaped—by death.

In just the same way, Heidegger argued, so Nothing is what shapes Being generally. This reveals the most fundamental, transcendent reality, beyond all notions of what-is slipping over into whatis-not. Even in the historical tradition, according to Heidegger, Nothing is shown to be the concomitant rather than the opposite of Being. The only genuine philosophical question is why there is something rather than nothing.

The Ground of Metaphysics

Writing allegorically in "The Way Back into the Ground of Metaphysics," *Heidegger* notes that although metaphysics is undeniably the root of all human knowledge, we may yet wonder from what soil it springs. Since the study of beings *qua* beings can only be rooted in the ground of Being itself, there is a sense in which we must overcome metaphysics in order to appreciate its basis. Looking at beings of particular sorts—especially through the distorted lens of representational thinking—blocks every effort at profound understanding. We cannot grasp Being by looking at beings.

This was the point of Heidegger's introduction of the term *Dasein*. It isn't simply a synonym for "<u>consciousness</u>", he maintained, but indicates the vital fact that human beings—and only human beings—truly exist, in the fullest sense, only when being-there for-themselves. Properly understood, self-awareness leads to the <u>authenticity</u> of a life created out of nothing, in the face of dread, by reference only to one's own deliberate purposes.

For this process of self-creation, Time is crucial. What we are at present matters less than what we are becoming, through the dynamic temporal process that constitutes our personal histories. There is no abstract <u>essence</u> of human nature; there are only individual human beings unfolding themselves historically. In the end, this is the answer to the question of why there is something rather than nothing.

It is only because we choose being-there.

1.2. Your wish is my command Justin Mullins

From New Scientist magazine, vol 172 issue 2322, 22/12/2001, page 62

Here it is, the ultimate toy-and if you break it you can't get caught

HERE'S a moral dilemma to mull over this Christmas. You're playing with a model train set, not yours. You're bored. What you'd really like to do is put one train on a collision course with the other, sit back and watch the disaster unfold.

But the collision might damage the trains. More worryingly, the owners might catch you at it. And how would you feel if this were your train set?

Relax. You're controlling this railway over the Internet. A live video feed shows you the trains and a program allows you to pick the destination of each one. You don't know the owners and they don't know you but, by making the website public, they have invited you to play. If they've placed two trains on the same track, that's their problem-and anyway, you could claim that any collision was simply an accident.

Welcome to the world of telerobotics, the emerging field of long-distance remote control. Forget the comparatively primitive kinds of remote control we use to switch TV channels, say, or steer radio-controlled cars. For teleroboticists, the vision is far grander.

Their world has been transformed by the convergence of two technologies: the Internet and robotic machines. It means that one day, schoolchildren could carry out experiments on the space station while engineers on one side of the planet fix a broken power generator on the other side.

But this revolution could also change our notions of responsibility and morality. Punch someone and they'll punch you back; crash your car into someone else's and you pay to have them fixed. This knowledge keeps the world in a delicate balance. Change it and who knows what will happen? The dangerous thing about telerobotics is that cause can be separated from effect.

But don't head for the bunkers just yet. As with any emerging technology there is fun to be had while it matures, and the nature of telerobotics means we can all play. Want to drive remote controlled cars in the US or control "remotebots" in Germany? They're all there on the Web (see "Click here to play"). One robot, called ANU, at the Australian National University in Canberra can be steered through the campus offices. Naturally, the offices are full of people, conjuring up a scenario rich in potential accidents-a bruised leg or a crushed toe, perhaps. Go on, they'll never know it was you.

Then there is the bot that moves among the snakes in a Brazilian reptile house. The images send a chill down the spine but so does the possibility that your instructions to the robot could be crushing a rare and beautiful animal to death. It might have been a genuine accident this time but try telling that to the zookeepers. Who would believe you after what you did to those trains?

Of course, the destructive potential of these robots is not quite that easy to harness, at least not yet. For the most part, telerobots are clumsy and unreliable, and as for the Web, anyone with a standard domestic Internet connection knows how well that works. "The major challenge is overcoming the time delay the Internet introduces," says Roland Siegwart, a teleroboticist at the Swiss Federal Institute of Technology in Lausanne.

Log on to steer a robot and you'll see what he means. Your commands take time to reach the robot and the images take even longer to come back. The return journey takes at best a second or two and at worst forever. It doesn't take much imagination to foresee the problems this causes.

NASA knows this better than most. In 1996, it sent a rover called Sojourner to explore the surface of Mars. The robot was given some autonomy, but to prevent accidents, NASA built in safeguards that made the rover stop and wait for commands from Earth if, for example, it started to tip over.

What NASA had not anticipated was that the rover would constantly tilt beyond the fail-safe point and be forced to wait ages for a message from Earth to set it going again. As a result, it was stuck in an area called the Rock Garden for weeks.

That's not a problem for the latest project from Ken Goldberg, an electrical engineer at the University of California, Berkeley. He has experimented online with everything from gardening robots to Ouija boards. Now, for the ultimate telerobotic experience, he has connected a person carrying a webcam to the Internet and allows users to control the person's movements.

Goldberg says this could revolutionise the traditional school trip. A "tele-actor" could travel to the rainforests or the top of a mountain while the school party decides from the classroom which way to go. Turn a journalist into a tele-actor, and television news might never be the same again.

Goldberg worries about the moral issues that telerobots raise, so he set out to test them. In 1996, he set up a telerobot that allowed users to burn holes in a \$100 note, which is a crime in the US. How many users would think twice about such an anonymous and apparently harmless crime?

But the exercise was more complicated than that. One claim was that the website was faked. Instead of live images, the suggestion was that users were seeing a series of carefully selected library pictures.

This issue puts telerobot users in a bit of a pickle. How can they ever know that their commands are really carried out? And if so, why should they worry about the consequences? According to Goldberg, this is an insidious problem that could eat away at the moral fabric of an online society.

Imagine, they say, a website showing live film of a human head in the cross hairs of a rifle, with a button that controls the trigger. Pressing the button shows the head blown apart by a bullet. If you pressed the button would you be guilty of murder, attempted murder or just plain stupidity? Would you even care?

Thankfully, not everyone wants to spend their surfing time taking potshots at strangers. So if you aren't lucky enough to get a train set this Christmas, no matter. Just log on and start playing with the online model. And while you're there, be thankful that each train is programmed to move out of harm's way should some idiot try to smash them together.

Beyond Webcams: An introduction to online robots edited by Ken Goldberg and Roland Siegwart (MIT Press, 2001)

1.3. Facing a remote control future?

Could our brains be conned into thinking a certain way?

Could computers one day control peoples' brains? Professor of Cybernetics at Reading University Kevin Warwick believes the latest developments in bionic technology could make that science fiction scenario possible.

Recently Dr John Chapin of the MCP Hahnemann University School of Medicine in Philadelphia demonstrated that signals from neuron groupings in rats brains can be used to control a physical device without the rats actually carrying out a physical action themselves.

A rat's brain, in common with that of a human, is merely a highly connected network of neurons (brain cells). When an individual decides to carry out a physical action this is indicated by neuron activity.

What Chapin showed by monitoring the activity of 32 neurons through implanted electrodes in rats was that brain activity occurred before any action was carried out, thereby acting as a predictor of things to come.

The power of thought

The rats had been trained to pull a lever in order to obtain water, but when their "thoughts" were electronically linked to the water release, they rapidly accepted that they didn't need to move the lever but could get a drink just by thinking about it.

For humans, spinal chord lesions, perhaps due to an accident, and numerous different neurodegenerative disorders can result in a fully functioning brain, which is unable to control a range of movements.

The possibility, in the future, of electrode implants being used to take brain signals directly where they are needed for muscle contraction and relaxation is clearly an exciting one. It should mean that by rewiring the human body (to an extent at least) movement could be restored to otherwise dormant limbs, bringing dignity and self-sufficiency back to their owners.

All that will be needed will be for the human to learn (anew) how to think in order to walk or wave their arm.

Certainly humans walking by thought power alone is a big step on from rats obtaining water via the same technique, but it appears to be natural progression - something that will happen before long.

However it is not merely walking that can be accomplished. Essentially, as long as an achievement is physically possible then there is no reason why we cannot learn to do all sorts of things just by thinking about them.

Driving a car, making a cup of coffee and operating a computer are obvious examples, although anything that requires movement and can be automated is fair game - and that means just about everything.

Two-way electrode street

It must be remembered though that electrode links can quite easily be, and almost certainly are, bidirectional. So whilst messages can be transmitted from a brain in order to shake a leg or put the kettle on, signals can also be sent into the brain, either from another person or from a computer. For a rat this could mean that the creature is directed, by remote control, to a distant target, a passive being unable to overpower external drivers taking it in a direction not of its choosing. Surely this couldn't happen to humans. Surely our brains cannot be conned into thinking in a certain way and to send out signals that cause us to do something that is beyond our control? The simple fact is that, if Chapin's experiment shows us anything, it is that the remote control of humans is eminently possible. Whilst technological advance, of this nature, is very exciting in the short term, we must be aware of some of the pitfalls that might occur if we are not careful. If our thoughts, or those of a rat, can be employed to get us a drink or to move an object or limb then all well and good. But if that means signals from another human or machine can directly affect the way our brain works then perhaps we should think again while we still can.

1.4. The Telepresence Garment

Eduardo Kac

I first conceived the Telepresence Garment in 1995 to investigate the notion of the mediascape as an expanded cloth; i.e., to consider wireless networking as a new fabric that envelops the body. The Garment, which I finished in 1996, gives continuation to my development of telepresence art. This time, however, instead of a robot hosting a human, we find the roboticized human body itself converted into a host. The Garment was designed as an interactive piece to be worn by any local participant willing to allow his or her body to be engaged by others remotely.

A key issue I have been exploring in my work as a whole is the chasm between opticality and cognizance, i.e., the oscillation between the immediate perceptual field, dominated by the surrounding environment, and what is not physically present but nonetheless still directly affects us in many ways. The Telepresence Garment creates a situation in which the person wearing it is not in control of what is seen, because he or she cannot see anything through the completely opaque hood. The person wearing the Garment can make sounds, but can't produce intelligible speech because the hood is tied very tightly against the wearer's face. An elastic and synthetic dark material covers the nose, the only portion of flesh that otherwise would be exposed. Breathing is not easy. Walking is impossible, since a knot at the bottom of the Garment forces the wearer to be on all fours and to move sluggishly.

This work came out of the necessity to explore ways in which technology envelops the body and transforms identity, suppressing self-control and direct sensorial experience of the environment. Far from utopian or escapist portrayals of the potential of these technologies, the Telepresence Garment is a sign of their dangers.



The Garment is divided into three components. The Transceiver Hood has a CCD attached to a circuit board, both sewed to the leather hood on the left side, and an audio receiver sewed on the right side. The CCD is lined up with the wearer's left eye. Underneath the Garment, the wearer dons in direct contact with the skin what I call a Transmitter Vest, which is wired to the Hood and

which enables wireless transmission of 30 fps color video from the point of the view of the wearer's left eye. Enveloping the body is an opaque Limbless Suit, so called because one can't stand or stretch one's arms, temporarily reducing or eliminating the functionality of the limbs.

The emerging field of wearable computing suggests that the very meaning of clothing is changing in the mediascape. Instead of adorning or expanding the body, however, the Telepresence Garment secludes it from the environment, suggesting some of the most serious consequences of technology's migration to the body. Body sensations are heightened once the wearer removes the Garment. This pret- a-porter foregrounds the other meanings of the verb "to wear": To damage, diminish, erode, or consume by long or hard use; to fatigue, weary, or exhaust. The Telepresence Garment was presented publicly for the first time during the event <u>"Ornitorrinco in Sahara"</u>, created with Ed Bennett and featured in the IV Saint Petersburg Biennale, which took place in Saint Petersburg, Russia, in October of 1996.

1.5.Being there

How to be a 24-hour, 3-D marketer.

CUSTOMERS DON'T CARE what time it is when they do business—companies make them care. If you want to win them for life, be there whenever and wherever they want you to be.

Robert Woodruff, the man who took brown, bubbly sugar water—Coca-Cola—and turned it into a global cash machine, had a famous saying: "I want Coke to be within arm's length of desire." With that simple statement, Woodruff set out to make Coca-Cola the first ubiquitous product in the world.

Today, Coca-Cola is the best example of what I call a three-dimensional marketer. The three dimensions are who, where and when. Coca-Cola does a pretty good job of knowing who buys Coke, and making it available wherever and whenever customers want it—mostly through vending machines and an extraordinary distribution network.

Until the Internet came along, this "anywhere" strategy seemed relevant to just a narrow range of marketing companies like Coca-Cola. Yet with cheap, ubiquitous technology available to any company today, there's no reason why everyone can't try to be a 3-D leader with an anywhere, anytime strategy based on clear customer knowledge and targeting.

We're already seeing market leaders such as AOL and Fidelity follow Coca-Cola's lead. You can currently get AOL via its own ISP, over the Web, through the television, and on cell phones and PDAs; the company has plans to put AOL in physical locations such as schools, ATMs and Kinko's. Fidelity was one of the first companies to make trading and financial information available to customers on all forms of wireless devices. Recently, it announced a joint effort with GM to offer access to Fidelity accounts in all GM cars.

Advertisers

Why are AOL and Fidelity heading this way? If all people will have the potential to be connected at all times in all settings through the Internet and wireless phones, then you always want your product or service available to them. Imagine the power of taking a category of valuable products, such as financial transactions, and making it available all the time, everywhere. Not only will products and services be accessible at the consumer's moment of greatest interest, but the potential exists to stimulate further demand and alter patterns of usage.

Product or service ubiquity is a race where being first means everything. The company that reaches far beyond its nearest competitor in terms of anywhere and anytime access will gain virtually unshakeable market share. Pepsi has been chasing Coca-Cola for 80 years and has not yet

made a significant dent in Coke's market share. Likewise, those financial services companies that try to compete with Fidelity will lose if Fidelity makes its way to everywhere status.

With ubiquitous availability comes an understanding of your customer that is simply not possible in a place-and-time constrained context. Letting people do business with you whenever and wherever they want gives you understanding of their natural patterns of buying activity—their true desires. But you can't do that without making your products available 24/7. Banks have gained a glimpse of the far-reaching power of 24/7 availability: Online customers are 50 percent less likely to switch banks, and those who pay bills electronically are even less likely to leave. Today there are companies that excel on one or two of the who-where-when marketing dimensions, but not all three.

Direct marketing companies such as Lands' End know who reads its catalogs and a little bit about where. These companies analyze the who so that they can create new offers and achieve more yield from their existing customers. They know where someone lives, but they do not know where they usually shop, where they buy goods.

Where can also mean big business: The great retailing companies have the where down to a science. Ever since the days when Sam Walton piloted his small propeller plane across the heartland of America to survey potential new sites for a Wal-Mart, companies like his and McDonald's have turned the issue of where into high art.

These companies' locations have made them staggeringly rich. Famed for its ability to crack the code of site selection, McDonald's sees 45 million customers a day—Wal-Mart more than 90 million a week. Yet these two companies know virtually nothing about their individual customers. There is no individual profile of each customer, only aggregate statistics to predict what type of customer will visit and where. Because McDonald's does not know who that individual is and how to contact him cheaply and efficiently, it cannot influence his buying decision to come to McDonald's on a particular day instead of going to Burger King.

Not surprisingly, when is the most misunderstood

The company that reaches far beyond its nearest competitor in terms of anywhere and anytime access will gain virtually unshakeable market share.

and least pursued dimension of marketing. The legacy of traditional shopping and working hours has led most companies to ignore its potential. Yet there is nothing more important to revenues and market share than understanding when someone is in the mood to buy. Some mainstream companies have made blunt efforts to discover the when of their customers' desires. For example, 7-Eleven in Japan restocks 20 percent of its stores five times a day to meet the morning, lunch, after school, dinner and after-dinner demands of its customers. This builds trust in the minds of its customers because 7-Eleven will have what the customers need, when they need it. Other nascent instruments include timing car company ad banners to appear when someone is searching in the automobile category on Yahoo.

When you put a 3-D strategy in place, make sure you put concrete measures in place. You need to show that this increased clarity in marketing can attract more customers to more profitable products more efficiently.

Technology is key to this who-where-when initiative, and there are three steps you can take to integrate a 3-D strategy with your technology strategy.

First, recognize that each new interface you create is a new challenge—and opportunity. You must have a technology architecture that can help create unity for your customer, not new and different interfaces each time. Imagine if Coke came in different size bottles or in different colors every time you bought it; there would be no brand as we know it today. That is what you need to keep in mind as you take your customer through different menu trees, voice mails, e-mails and Web interfaces.

Second, make sure you link your interface architecture to your customer value management approach. Each interface point is a potential control point for cross-selling, quality and service.

Third, show your senior management that your information systems control or influence what your management systems can do. Always drive to create management systems that are at least as fast and flexible as the customer's buying cycle. Cisco can close its books every night. Its business cycle is that fast. Can you?

1.6 There is no simulation like home



Paul Sermon

This installation entitled There's no simulation like home is the culmination of artistic telematic research since 1992. The exterior of the installation resembles the back of a plasterboard stage set, or as if the bricks of a house had been removed to reveal the back of the inner plasterboard skin. Electricity and video cables are traced and attached all around the surface of the structure, looking like the back of large circuit board. The installation is architectured on the ubiquitous form of the English terraced house. Using a walk through narrative sequence, from front door to back door, the audience encounter differing telepresent interfaces in each of the four rooms: the living room sofa, the bedroom, the dining room table and the bathroom mirror. Before entering the installation the audience have the possibility to view the installation through a series of peepholes positioned along the plasterboard exterior.

Inside the installation the audience are encompassed within a simulated domestic home environment, exemplified in the dimensions of the rooms, the wood-chip wallpaper, the light fittings, skirting board and wall sockets. The living room sofa and television screen form the first telematic link outside the installation space, where a second sofa and video monitor are located. By using a system of live chroma-keying the two separate people, who could be any distance apart, share the same sofa on the same telepresent screen. In the bedroom the viewer can lie down on a bed onto which a live video projection is being made of another person, who is located outside the installation space on a second bed. A video image of the combined audiences together on the projection bed allow the viewers to interact in a telepresent space by touching with their eyes. The exterior installation space communicates a contrasting image to the domestic interior. Unlike the inside, the technology is very visible - akin to a media lab environment. The telepresent interfaces located on the outside of the installation, appear as areas for interaction and observation of the experiment like situation taking place inside the installation. In keeping with the techno reference of the exterior installation, video images from small surveillance cameras inside are constantly being displayed on monitors outside.

The dining room table is the third telematic interface to the outside installation. Offering a slightly less psychological complex platform for interaction. Working with a system of live chroma keying between two separate tables the remote viewers are able to sit at the same table in the same telepresent room. The final room and interface the audience confront before exiting out the back door, is the bathroom mirror. What initially appears to be a normal mirror, lacks one essential truth - the viewers own image. A momentary illusion that is broken only when the viewer realises the mirror is in fact a window into an identical room. Whilst we have become accustomed to accept the existence of ourselves in telepresent forms throughout this installation. we are finally denied the most simple telepresent truth we expect from a mirror, putting the notion of the real and the virtual into question. By representing the domestic reality inside the installation as a fabrication of

the technological apparatus outside. There's no simulation like home attempts to present realities as a construct of language. This installation serves as a contextual wrapping for the telematic research and developments used within it.

1.7 Just Being There Santikaro Bhikkhu

Many Thai monks, not to mention those in neighboring countries, and especially those dedicated to meditation, have a strong love for the forest. Herbal medicine is another factor binding them to Nature. Thai culture was always, until recently, very close to Nature: the rivers, fields, and forests. Thai Buddhism gives a healthy emphasis to Nature and the forests are a focal point for being intimate with Nature in order to become intimate with Dhamma. The Buddha's life story illustrates this powerfully. He never went to university and learned the essentials of life in the forest or wilderness.

So many of us monks live in bits and pieces of forests, some healthy, many degraded (like ours here at Dawn Kiam). When we live in them, the local people begin to change their attitudes to the place. It becomes more respectful. Perhaps they are reminded of their old values.

It used to be that the forests were boundless and nobody thought they could ever end. They were also seen as dark and dangerous, inhabited by fierce animals, thieves, and spirits. The peasants took from them what they needed -- not all that much -- since society allowed them little else. Then came colonialism and systematic resource extraction; yes, the West introduced it here. The peasants were encouraged to take more and more from the forest to sell. The peasants' land was expropriated, so they had to cut deeper into the forest. Finally, oil-powered technology came in and mowed down the forest. So in addition to being pushed into cutting down the forests, the peasants get the rapacious examples of their own elites and the Western world rubbed in their faces by TV. They end up wanting a tiny bit of the action too. They see nothing wrong with cutting down a tree, shooting a langur, catching a python to sell to a zoo, burning a swamp to get turtles, etc. Putting some monks in the way is a non-violent means to slow down the devastation. Some monks are willing to be there.

But "there" is shrinking and the competition for forests is getting intense, whether for resorts (middle-class folks from towns and abroad), military purposes, agro-forestry (eucalyptus, bamboo), or meditation. Having bought off and crippled the Sangha hierarchy, the government is increasingly able to intimidate monks off the land. The government pressured the Council of Elders to pass a rule making it harder for monks to dwell in forests. It may be a losing battle, but there are still monks who are willing to try and lay folks who back them up, even in the government.

In short, the job of monks is just "being there." In our utilitarian age, they are expected to do more. But just being there may be the best part of the answer. It involves a sacrifice of comforts and conveniences that the middle-class will only make on camping trips.

There are attempts to reforest, too. Some are done with wisdom, others are business and government inspired schemes that put in cash crops at the expense of ecosystems. Many monks could use help in trying to practice wise reforestation. The foolish, greedy kind gets loads of support, including international investment.

More active confrontation of the powers that be is not common. Look what happened to the few monks who tried -- aint monks no more! Newspapers were found to dirty their names, trumped up charges were filed in a corrupt injustice system, bullets shot over lay supporters heads (or worse), and few senior monks backed them up.

Still, as the conflicts over resources intensify, more monks will be on the firing line. International backing may save some of them. In each case were the monk is not protected, the villagers will fare even worse. If the monk is able to do his job, he can help insure the safety of the villagers. Some respect for the robes lingers.

Much more could be said; this is just a quick rundown.

1.8 VR Therapy for Spider Phobia

Phobics typically panic or become anxious when they encounter the object or situation that makes them afraid, even though they know the object or situation (e.g., a small house spider) is not that dangerous. Such unrealistic or excessive fears of objects or situations is a psychological disorder that can makes life miserable for years. Exposure therapy has proved effective for many different types of phobias, including spider phobia. Exposure therapy is a clinical treatment based on gradually and systematically exposing the phobic person to the feared object or situation a little at a time, starting very slowly, and calming them. Little by little their fear decreases and they become more comfortable with spiders. They will probably always be a little creeped out by spiders, but therapy can train them not to panic. After treatment, most "former phobics" start living life more fully. Success overcoming their fear can lead to increased self-confidence, which in turn often has other positive benefits.

In vivo exposure therapy, is a combination of cognitive psychology and behavioral therapy (Cognitive-Behavioral therapy, which is not Freudian). People are taught to think a little differently when they think about spiders (this is the cognitive part of the therapy, where cognition means "thinking"). In addition, during treatment phobics are deconditioned using stimulus-response learning (and unlearning). This is the Behavioral part of the treatment.

Pavlov, an early behaviorist, paired a stimulus (a bell) with the presence of food. Every time the dog heard a bell, they got some food. After doing this enough times, the dogs started to associate the bell with the food. The dogs would start salivating when they heard the bell, even if there was no food present. It is believed that spider phobia is due at least in part to a similar Stimulus-Response association. The spider, the stimulus, evokes a response, fear and anxiety. Every time the phobic runs in fear from a spider, it strengthens or at least helps maintain this association. Avoidance feed phobias.

Did you know that the Stimulus-Response conditioning can be reversed? A dog that has been conditioned to salivate when they hear a bell can be untrained! If you ring a bell without presenting food a bunch of times, pretty soon the association or link, the Stimulus-Response association between bell and food disappears, and the dog no longer salivates (or salivates much less) when they hear the bell. The behavioral therapy part of VR exposure therapy uses a similar approach to treat spider phobics. With in vivo (in life) exposure therapy, under a therapist's supervision and guidance, rather than avoiding it, the phobic slowly approaches the thing they are afraid of in the real world...the phobics initially display a rapid increase in anxiety, but if they hold their ground instead of fleeing, their fear and anxiety will actually habituate. They stop sweating, their heart rate slows down, they feel less anxiety, even though they are standing fairly near a spider! It is as if their nervous systems start to get bored with the spider. During this phase of in vivo exposure therapy when their anxiety is going down in the presence of the live spider (e.g., a tarantula in a terrarium), they are reversing the Stimulus-Response association. The stimulusresponse association is sort of "cancelled out" by the new association between the presence of the spider, and a DROP in anxiety! That is, they start to associate a spider with becoming LESS anxious. In addition, the therapist explains a number of things to the patient, and helps the patient think differently about spiders. This helps the phobic think differently about their own anxiety (this is the cognitive portion of the treatment). It will be a few years before VR exposure therapy is more widely available. While it is possible to go get treated with VR right now, you may not be able to go al the way to Los Angeles to get it.

Virtual reality to the rescue

Albert Carlin and Hunter Hoffman, and Suzanne Weghorst published the second Journal paper on VR exposure therapy. At the suggestion of one of Al's patients, Al and Hunter extended Rothbaum and Hodges idea of using immersive virtual reality for exposure therapy to a new type of fear:

spider phobia. It was actually the idea of Miss Muffet, the first patient they treated together. Prior to treatment, Miss Muffet had been clinically phobic for nearly 20 years and had acquired a number of spider-related obsessive-compulsive behaviors. She routinely fumigated her car with pesticides and smoke to get rid of spiders. She sealed all bedroom windows with duct tape each night after scanning the room for spiders. She was hypervigilant, searching for spiders wherever she went, and avoiding walkways where she might find one. After washing her clothes, she immediately put her clothing inside a sealed plastic bag, to make sure it remained free of spiders. Over the years, her condition became worse. When her fear made her hesitant to leave home (a very extreme phobia), she finally sought therapy.

Even though traditional therapy is usually effective, Miss Muffet didn't feel like she was making much progress with more traditional therapy. The possibility of using pharmaceutical anxiety treatments was being considered. Miss Muffet happened watch a Scientific American Frontiers program on PBS that featured the VR exposure therapy for "fear of heights" being done in Atlanta by Hodges and Rothbaum. Miss Muffet told Al Carlin, her therapist, that she wanted to try a virtual spider. Many if not most therapist would have scratched their heads and said "what in tarnation is that". Luckily Al Carlin knew about the HITLab, a large VR research lab at the U.W., he called us, and ended up finding Hunter Hoffman, who agreed to work with him to co-build the first VR exposure therapy world for spider phobia: SpiderWorld.

An image of what patients see (in 3-D) in SpiderWorld... their cyberhand as they grab a wiggly legged virtual tarantula



During the 12, one hour VR therapy sessions at the U.W. Human Interface Technology laboratory (HITLab), Miss Muffet started very slowly. First she started completely across the virtual world from the virtual spider. Slowly she got a little closer, her progress closely monitored by Al and Hunter who watched what she was seeing in VR, which was also displayed to them on a compute monitor. In later sessions, after she had lost some of her fear of spiders, she was sometimes encouraged to pick up the virtual spider and/or web with her cyberhand and place it in orientations that were most anxiety provoking. Other times, the experimenter controlled the spider's movements (unexpected jumps, etc). Some virtual spiders were placed in a cupboard with a spiderweb. Other virtual spiders climbed or dropped from their thread from the ceiling to the virtual kitchen floor. Eventually, after getting used to them, Miss Muffet could tolerate holding and picking up the virtual spiders without panicking. She could pull the spider's legs off (initially this occurred accidently, and then deliberately at the experimenter's request). A large brown virtual spider with photograph-quality texture-mapped fur (made by Scott Rousseau and Ari Hollander (see www.imprintit.com), and later re-made with animations by Duff Hendrickson), and a smaller black spider and an associated 3-D web were employed (by far the best spider (just kidding) was the one Hunter made, virtual black widow spider, which reminded Miss Muffet of the spiders she saw in her nightmares described next). The black one was flawed in that it was possible to pull the virtual legs off, if one grabbed it right. This turned out to be good.

After only two, one-hour Virtual Reality exposure therapy sessions, Miss Muffet was noticing some very important progress. For example, prior to VR treatment, she had a recurring nightmare about spiders (very scary). After her second VR exposure session, she had her nightmare again that night, but it was no longer scary. In fact, in her dream, she was able to talk to the spiders for the

first time, and scolded them for scaring her. "Don't feel bad lady, we scare everyone", said their cigar smoking thug leader in her dream. "Well STOP IT" she told them in her dream. ...

Toward the end of Miss Muffet's therapy (e.g., after about nine, one-hour sessions), Al Carlin and Hunter started running out of new tricks to use to evoke anxiety from Miss Muffet. Miss Muffet reached out with her cyberhand in the virtual world to touch the virtual spider, but contrary to her earlier panic reactions, she had only a little anxiety now, since she had gotten used to grabbing the virtual spider.

In order for therapeutic progress to continue, Hunter and Al had to come up with some new spider behaviors or new spider-related experiences that would initially evoke an anxiety response, so they could continue to habituate Miss Muffet. They tapped a technique called mixed reality Hunter had been studying in some other VR research. One wierd thing about virtual objects is...they are typically only visual illusions, when you reach out to touch a virtual spider, your cyberhand goes right through the spider. If you reach out to touch a virtual wall, typically your virtual hand sticks right through the wall like something from a Sci Fi movie. This quality of non-solidity is interesting and fun, but it detracts from VR's realism. To give the virtual spider solidity and weight (cyberheft), Hunter rigged up a furry toy spider with a bad toupe, such that when Miss Muffet reached out to touch the virtual spider in the virtual world, her real hand simultaneously touched the furry toy spider in the real world! Although we told her it was coming, Miss Muffet was quite surprised when she had the illusion of physically touching the virtual spider. Suddenly, the virtual spider she had grown accustomed to touching without anxiety (i.e, during therapy), now evoked a huge anxiety response. But...as predicted, Miss Muffet even got used to this "mixed reality" spider. It is called mixed reality because it was part virtual ... the visual animated spider in VR, and part real, the tactile cues from the real toy spider. See the following papers for more info on Hunter's research on tactile augmentation or mixed reality at www.hitl.washington.edu/people/hunter/).

According to Miss Muffet, this extraordinary experience/illusion of physically groping the plump furry body of a Guyana bird-eating tarantula was a big turning point. She said after she had gotten over the anxiety that evoked, she was largely cured. After holding that virtual beast, an ordinary real spider in her real kitchen was not scary at all. A subsequent controlled experiment with 36 participants showed that Miss Muffet was right....exposure therapy culminating in the handling of a mixed reality spider increased therapeutic effectiveness compared to the same therapy without any mixed reality (e.g., with only virtual spiders that couldn't be physically touched).

During the course of therapy the patient could also squash the virtual spiders with a mixed-reality ping pong paddle. These interactions in VR caused her great anxiety, including trembling, sweating, and dryness of mouth, and feeling on the verge of tears.

Prior to VR treatment, the patient filled out a fear-of-spiders questionnaire. A sample of 280 undergraduate psychology students filled out the same questionnaire as a comparison group. The undergrads received no treatment and gave their ratings only once. Initially, only one undergraduate had a higher fear-of-spiders score than the patient. After 12 weekly one-hour desensitization treatments for the patient, 29% (80 students) had higher fear of spiders scores than the patient. ...

She is the first spider phobia patient to be cured using immersive VR therapy. This case study (Carlin, Hoffman and Weghorst, 1997) provides converging evidence to the growing literature showing the effectiveness of VR for medical applications. We have since treated about 20 clinical phobics with a success rate of approximately 85% at the HITlab and continue to conduct research on this interesting topic.