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Futures and Alternative Nows

Interviews with Tony Dunne and Fiona Raby, John Maeda, and Jun Rekimoto

We're not interested in futures, as in technical futures or scientific futures or technological futures, but more in alternative nows: how things could be right now if we had different values. It's about the psychological approach to design; psychological need and complex need. Instead of need being purely functional, we are looking at the idea of a more emotional and psychological need.

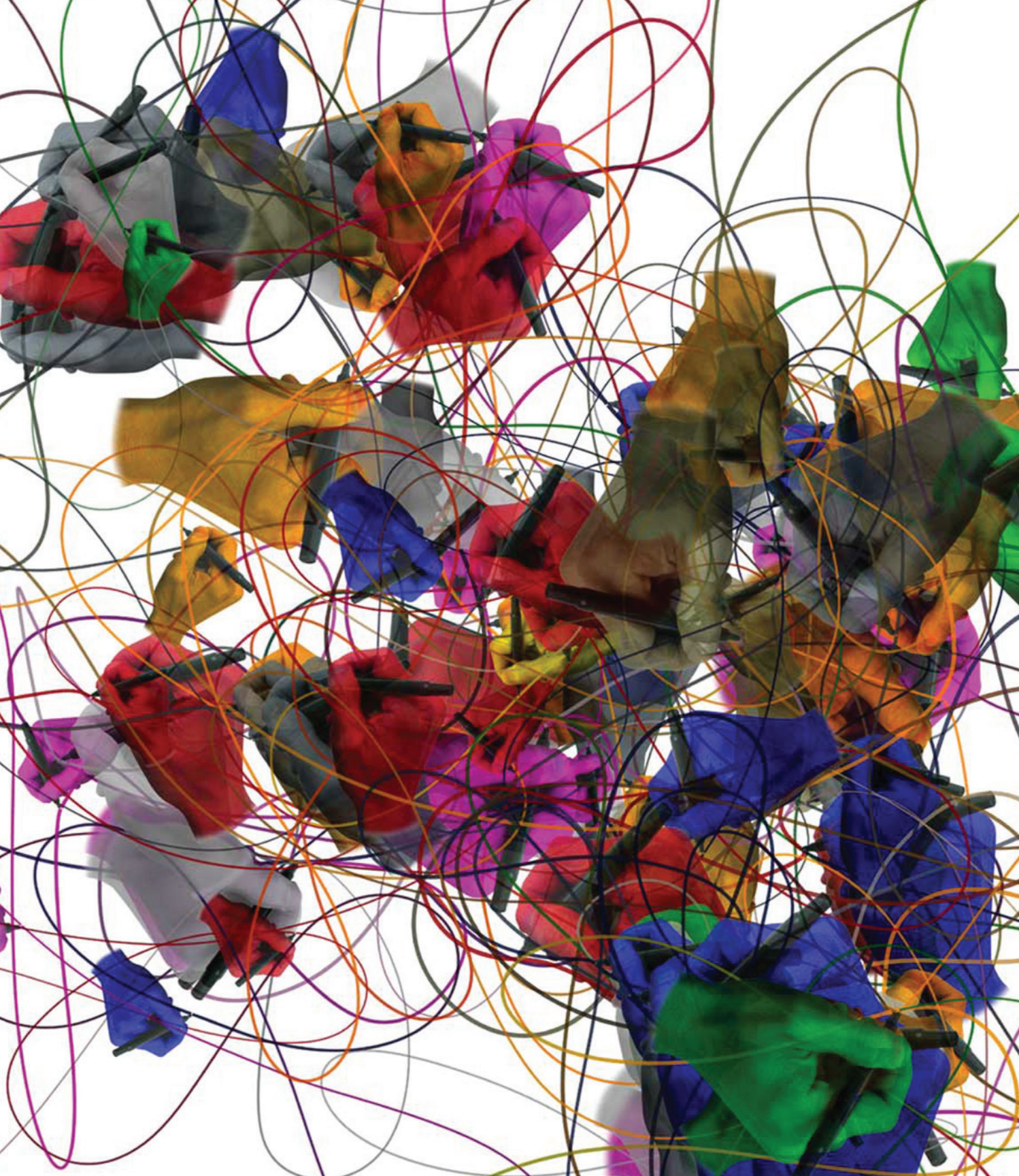
Dunne and Raby[1]

Tony Dunne and Fiona Raby suggest an "alternative now" that belongs more in the aesthetic mists of the arts than in the pragmatics of functionalism. They explore complex pleasures and existential design with a delicate wit that makes you smile on reflection. You will discover in the interview that follows that their work has a lot in common with the "aesthetic, social, and cultural interventions" of the Equator project, explained by Bill Gaver in the previous chapter, perhaps partly because they have worked together with Bill at the Royal College of Art in London, forming a node in a community of ideas about technology and design.[2]

■ Energy Futures, London Science Museum, 2004: a scenario from Dunne and Raby shows children growing meat to provide energy to operate a TV

Photo
Jason Evans

If we return to David Liddle's explanation of the three phases in which technology is adopted[3]—the enthusiast phase, the professional phase, and the consumer phase—we can see the "alternative now" proposed by Dunne and Raby as a sophisticated extra layer within the consumer phase. The most obvious type of consumer adoption of technology is when prices fall far enough for everyone to be able to make use of a technology, and the design has been developed enough to make it easy and enjoyable



for people who want to use it. David Liddle gives the example of the 35mm camera, where the technology for automatic exposure, focus, flash, film wind, and so on, are well enough evolved for anyone to be able to take the best possible snap in the circumstances. The "alternative now" that Dunne and Raby offer is something beyond the obvious functionality of the consumer product: they look for more complicated pleasures that hover on the border of the subversive and artistic, but always offering some comment on humanity. What could you do with the camera to offer food for the soul as well as materialistic gratification?

John Maeda[4] has produced a wonderfully rich body of work as a digital artist and designer, and the designs coming from the students and researchers at his Aesthetics & Computation Group at the MIT Media Lab have been stellar. In 2003 he suddenly decided to start again and create a new group called the Physical Language Workshop (PLW), plus an associated research initiative called "Simplicity," with an "alternative now" that seeks to return to simpler values and behaviors in the digital realm. Perhaps this is the start of the digital equivalent of the Arts and Crafts movement inspired by William Morris in reaction to the Industrial Revolution,[5] or perhaps more like the Bauhaus in rethinking design. Will John lead us toward something equivalently inspirational for the information revolution? In his interview he describes the start of his search.

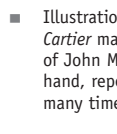


Illustration for *Cartier* magazine of John Maeda's hand, repeated many times

Image
Copyright John Maeda, 2005

Jun Rekimoto[6] is building a more direct future, concerned not so much with alternatives as with enabling some of the many promises of interactive technology. As director of the Interaction Laboratory at Sony in Tokyo, he is leading a group of computer scientists and designers to develop a future that offers alternatives to the graphical user interfaces on the devices that we use today. In his interview, he talks about the research that he is doing to make the concept of "ubiquitous computing" a reality.[7]

Photo Author

Fiona Raby and Tony Dunne

"We are interested in using design as a medium, to ask questions and provoke and stimulate people, designers and industry," says Tony Dunne. "We are exploring things that exist somewhere between reality and fiction," adds Fiona Raby, as they explain their philosophy of design. When you first meet them, Tony and Fiona seem shy, almost diffident, but they soon communicate their passion for complex pleasures and existential design. They have their own studio[8] in London, where they consult, write, and research. They use products and services as a medium to stimulate discussion and debate among designers, industry, and the public. Many of their projects are collaborative; they work with industrial research labs, academics, and cultural institutions. They were founding members of the Computer Related Design (CRD) Research Studio at the Royal College of Art in London and were based there from 1994 to 2002. In 2004 Tony was appointed as head of department and professor of interaction design, and Fiona as tutor. They describe the work of the department in three overlapping areas: "technology as medium"[9] looks at the aesthetic and functional potential of new technology by playing with it and experimenting directly with the material; "technology as product"[10] imagines new services and products and considers how they fit into preexisting social, cultural, economic, and technological systems; and "technology as critique"[11] makes the social and ethical implications of different technologies tangible and, as a result, debatable. They see the Interaction Design Department as a place where people who are frustrated with the limitations of their original disciplines can gather to figure out which bits of what discipline—from anthropology and architecture to computer science, fine art, and design—can combine to create better, more human, electronic products, media, and services.

Tony Dunne and Fiona Raby

Complicated Pleasures

Tony Dunne and Fiona Raby spend a lot of time looking at newspapers, searching for the odd story about a real event that is surprising or unexpected. They are constantly collecting examples of reality that seem stranger than fiction, as they find this can provide inspirational raw material for thinking about emotional responses. For example, they recently found an article about a father whose daughter died, and when she was cremated, he had her ashes turned into diamonds, and then gave the diamonds to different members of the family. They found that story interesting because it explored the relationship between the idea of a person and precious objects. A real company was offering this as a service, but if they had proposed the concept as an art project, it would have seemed very poetic, strange, and unrealistic.

Another example was a very small Japanese car that had been equipped with powerful sound system and a bank of switches controlling simulations of different engine noises. The driver could choose whether to sound like a Ferrari, a monster truck, a Harley Davidson motorcycle, or a range of other options. The appeal of making a tiny car sound "wicked" shows irrationality,

but it is also an example of something that people love to do. Dunne and Raby like designs that pander to the bad side of people—the side that is complicated, irrational, and contradictory. If you filled the material world with objects that reflected those values, they wonder, how different would it look from the material world that surrounds us now, as our lives are so often filled with things that exude niceness and rationality?

They talk about this borderline zone between pragmatic design and emotional experience, giving examples to illustrate their ideas:

TONY I think what we're researching, really, is the idea of complicated pleasure. The pleasures you get from reading a book or watching a film are the kinds of things we're exploring in relation to products. How can you design products that provide complex and complicated pleasures, that stimulate our imaginations, create dilemmas, make us think, and rather than smoothing out our lives, actually create glitches?

Our interactions with purely physical objects, like glasses and tables and things like that, are very sensual and physical, giving pleasures that have to do with the body; a sense of gravity, a sense of balance, and so on. With electronic products, the pleasures are more likely to happen in the imagination.

For instance, one product we really like to use as an example is the "Truth phone," which is a real product manufactured by an American company. It's basically a phone that has a built-in voice stress analyzer. When somebody calls you on it, you get a read-out of the likelihood of whether they're lying. So when you use that phone, you're thrown into a dilemma. You wonder why the person is lying to you. Is the technology accurate? That kind of narrative is a complicated pleasure that could only arise from an electronic product.

FIONA Also, there's room for interpretation, where people can reinterpret something. That's exactly what we're interested in. Leave space for interpretation in an object but enough clues with which to pick up a story. Perhaps it's not our story, but it will enable people to create other stories from the object. It all comes from the idea of looking at how people behave. We assume that there are certain behaviors, or ways you feel about other people, that we can empathize with. We play with empathy a lot.

Placebo Project

For the Placebo Project in 2000, Dunne and Raby developed a collection of electronic objects to explore mental well-being in relation to domestic electromagnetic fields.

They designed and built eight prototype objects to investigate people's experiences of electromagnetic fields in the home and placed them with volunteers. They suggest that once electronic objects are taken home, they develop private, or at least hidden, lives. Occasionally you can catch a glimpse of this life when objects interfere with one another or malfunction. Many people believe that mobile phones heat up their ears or feel their skin tingle when they sit near a TV, and almost everyone has heard stories of people picking up radio broadcasts in the fillings in their teeth. The interesting question is not whether these stories are true or scientific, but rather how people develop narratives to explain and relate to electronic technologies, especially in this case the invisible electromagnetic waves emitted by electronic objects.

The Placebo objects were designed to elicit stories about the secret life of electronic objects, both factual and imagined. Homes for the objects were found through a variety of means, including advertisements in a London listings magazine, workshops at a museum, a window display in a department store, and an article in a national newspaper. Potential adopters filled out application forms detailing any unusual experiences with electronic products, their attitude to electromagnetic waves, and their reasons for choosing a particular object. They were interviewed when their allotted time with the adopted object was up, and a photographer captured images to support what they were saying. In the written introduction to the project, Dunne and Raby say:

> Designers cannot always solve problems; we cannot switch off the vast electromagnetic networks surrounding us. Although we cannot change reality, we can change people's perception of it. Like a medical placebo, the objects in this project do not actually remove or counteract the cause for concern, but they can provide psychological comfort. The Placebo Project is definitely not scientific: although

> aware of ethnographic and anthropological methodologies, we chose to adopt a more informal process in this case. We wanted to prove that people are more receptive to radical ideas than industry acknowledges, and to test our ideas about aesthetic meaning and electronic technology. We accept that the group of adopters was self-selecting. We also accept that they are probably exceptional people, but they are real people, and anything we discovered was grounded in reality rather than fiction.

Their interest in electromagnetic fields was first aroused when they came across an article of underwear on the Internet called a "personal protection device." There was a male and female version. The underwear was normal except that it was covered in silver nylon, supposedly to protect you from radiation while using the computer: of course, this had no real protective effect, but was a placebo.

Dunne and Raby became interested in the notion of the placebo as a way of making relationships between people and spaces more ambiguous and open-ended. They did not think of these kinds of objects as designs for mass production, but rather as tools to think critically about how our technological lives are being shaped by industry and business. They liked the idea that these products would be available for rent, providing a service in the form of a reflective experience. Living with them for a while might encourage the borrower to think about the environment in a different way, especially in relation to electromagnetic fields:

> Take the placebo knickers for instance, if you wear these knickers for a day, and go about your ordinary life, would you deal with the world in a totally different way? Would you think about the electromagnetic environment differently? Would you become paranoid, or would you find some strange aesthetic pleasure in your adventure? What kinds of new narrative experiences might you have?

Each of the objects in the Placebo collection tries to provide a particular way of negotiating a relationship to electromagnetic fields. They talk about two of the designs:

"Personal protection device" (his) ■
"Personal Protection Device" (hers) ■

Placebo Project example: GPS Table

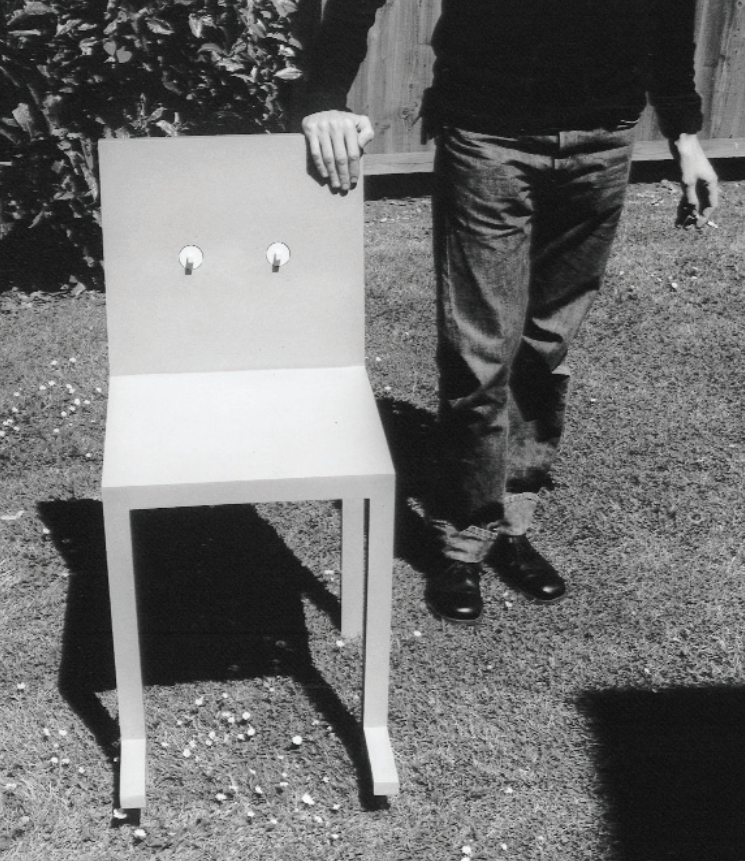
TONY An example of embedded behavior is the GPS Table, a small table with a global positioning system sensor inside it. The top surface contains a display, which shows its exact position. When it's indoors, it often can't communicate with the satellite, so it just says, "lost." Some people see that as a weakness in the design—that really it should be able to communicate all the time and give its position, but we see that as its function, because by being lost, it asks the owners to help in some way. Do they take the table out into the garden and let it communicate and fulfill itself, or do they try to comfort it, or live with it in other ways, because somehow this table is unfulfilled and frustrated?

FIONA What was also nice about the table was the different way in which people reacted to it. Lorna was looking after a child at home, so she was always in the house. It made her think a lot about her relationship to the table in the home and the satellites going round. When she thought about the table, she became humbled by it; suddenly, in an every day moment, she would feel that she was really small; this tiny person on the planet.

TONY She also talked about the table being physically there, but electronically absent. So she really understood the object as existing in two spaces; the space of the room, and this kind of hyper invisible electronic network. We are discovering that people are subtle in their appreciation of interactivity, and their relationship to electronic products.

■ Placebo Project, GPS Table—a table that displays its exact position in the world

Photos
Jason Evans

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Placebo Project example: Nipple Chair

FIONA The Nipple Chair uses electromagnetic sensors in the back of the chair, so if you're sitting in a field, the nipples will vibrate and you become very aware that your body is being penetrated by this field. We saw it as a very paranoid object, but Neil had a totally different interpretation of it. He actually loved and collected gadgets. He had a whole cupboard full of objects that he would never use; he would just collect them. He would get them out and look at them and love them, but he was totally perplexed by the chair. I asked him if he thought the chair was a gadget, and from the minute I mentioned it, he was constantly upset by the thought that it could be termed as a gadget. He kept changing his mind as to whether it was or wasn't a gadget. It was very strange.

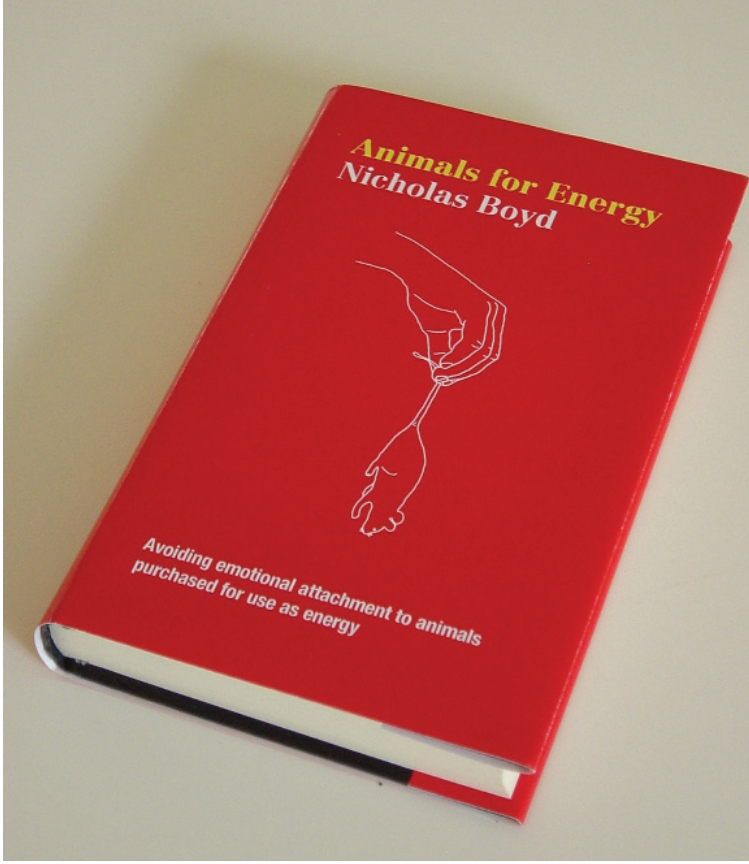
TONY One of the reasons he said it wasn't a gadget was that you couldn't control it. The chair just did what it did. The nipples vibrated when it picked up the field. He said if you could adjust its sensitivity, or it had another function like telling the time, it would definitely be a gadget. He saw it as an autonomous object that he just had to live with, or cohabit with. We thought of it as a paranoia-inducing object that would make him nervous and scared of the electromagnetic fields in his house, but he actually used electromagnetic fields to animate the object and interpret the object's behavior, as though it had moods or it was playing with him.

When he came in from work, for instance, he would walk across his nylon carpet and build up a big static charge. The object would sense that and become very excited, and he would say the object was pleased to see him when he got home. He knew exactly what was happening, but he enjoyed these stories that came out of living with it. His friends came around and he wanted to show it getting excited, but sometimes it wouldn't; he also liked that unpredictability.

FIONA He found it a little frustrating, because he'd want to show it off. He put something on it and it was supposed to move, but it didn't. I think he found pleasure in the fact that he couldn't control it as much as he wanted to. That was his complicated pleasure in the situation.

■ Placebo Project, Nipple Chair—the nipples vibrate in response to electromagnetic fields

Photos
Jason Evans


Animals for Energy
Nicholas Boyd
Avoiding emotional attachment to animals purchased for use as energy


JONES FAMILY
HYDROGEN


JONES FAMILY
HYDROGEN

Existential Design

At one point Dunne and Raby were thinking of "existential computing" as a category that would be interesting to explore, but on reflection they dropped the label as it was too connected to the world of computers. They are interested in products that behave existentially and are enabled by electronic technology but are not thought of as computers. They want to treat people as responsible individuals who make their own decisions about what is right or wrong, good or bad:

> The role of design seems to be to make the world a better place. It's as if designers have all sworn an oath never to think a bad thought. We seem to have this blind optimism about the future and about technology. Designers somehow automatically think that design is neutral and implicitly good.

Tony and Fiona encourage designers to consider both positive and negative scenarios when thinking about how new technologies become absorbed into everyday life. They see a new role for design as a medium for debate.

Two of their recent projects illustrated this approach. One was an exhibit aimed at children in the new Energy Gallery in the London Science Museum. Another was their biotechnology project, "Consuming Monsters."

Energy Futures, London Science Museum, 2004
- *Top left* Teddy bear blood bag
- *Top right* "Animals for Energy" manual
- *Bottom left* Electrolyser Backpack
- *Bottom right* Company uniform for family energy producers

Photos Jason Evans

Energy Futures, London Science Museum

> Tony One of the main messages the museum wanted to put across was that in the past it's been impossible to predict the future of energy. They told us that many predictions had been wildly wrong, so we put forward three different energy future scenarios, speculating on the social impact these futures might have on the life of a child, particularly trying to capture the imagination of a child.

> Fiona All the material from the museum was a little bit dull and biased toward hydrogen and hydrogen cars . . . so we did our own research, and found some very fascinating ideas about energy.

Teddy bear blood bags

TONY In probably the most unlikely scenario of all, we found out about a meat-eating robot being developed at the University of South Florida called Chew-Chew. It's designed to eat slugs using a technology called microbial fuel cells. They have living bacteria that break down food and convert nutrients into electrical energy. So we thought, "Imagine if this technology took off. How would things change?" It really sparked our imaginations. What would it mean? Animal and blood products as energy.

FIONA Maybe you would feed meat to domestic products like TVs and lamps; perhaps rodents, worms, or even human blood?

TONY Would humans and animals be exploited in new and horrible ways? Or would laws be passed to protect them? To replace batteries, we made an FM radio that uses a blood-bag in the shape of a teddy bear to power it. We use the language of design to make it more friendly and acceptable.

Poo lunch box

FIONA In another scenario we were inspired by a seminal book called *Cradle to Cradle*.[12] It told a story about rural farmers in China using biological waste on their paddy fields. When someone comes around for dinner they are expected to donate a "gift" before they leave, returning the nutrients from the meal back to the soil.

■ Energy Futures, London Science Museum, 2004: poo lunch box energy pack

Photo
Jason Evans

TONY How would social behavior and etiquette change if the main source of energy was human sewage?

FIONA But this isn't science fiction; we were told people living in Denmark can leave their poo out for the bin men. Apparently the world's largest chicken poo power station is in the UK.

TONY In this scenario one of the objects we designed was a poo lunch box. Perhaps children would be expected to bring their waste home from school in their sandwich box. Poo would be too valuable for the school to keep, as it would be needed at home.

Hydrogen

TONY The most likely use of hydrogen is as fuel for cars, but even there we wanted to hint at underlying motivations, showing that technology does not always bring the best out in people. In our hydrogen scenario we looked at how over-competitive parents might exploit their children, a return to child labor.

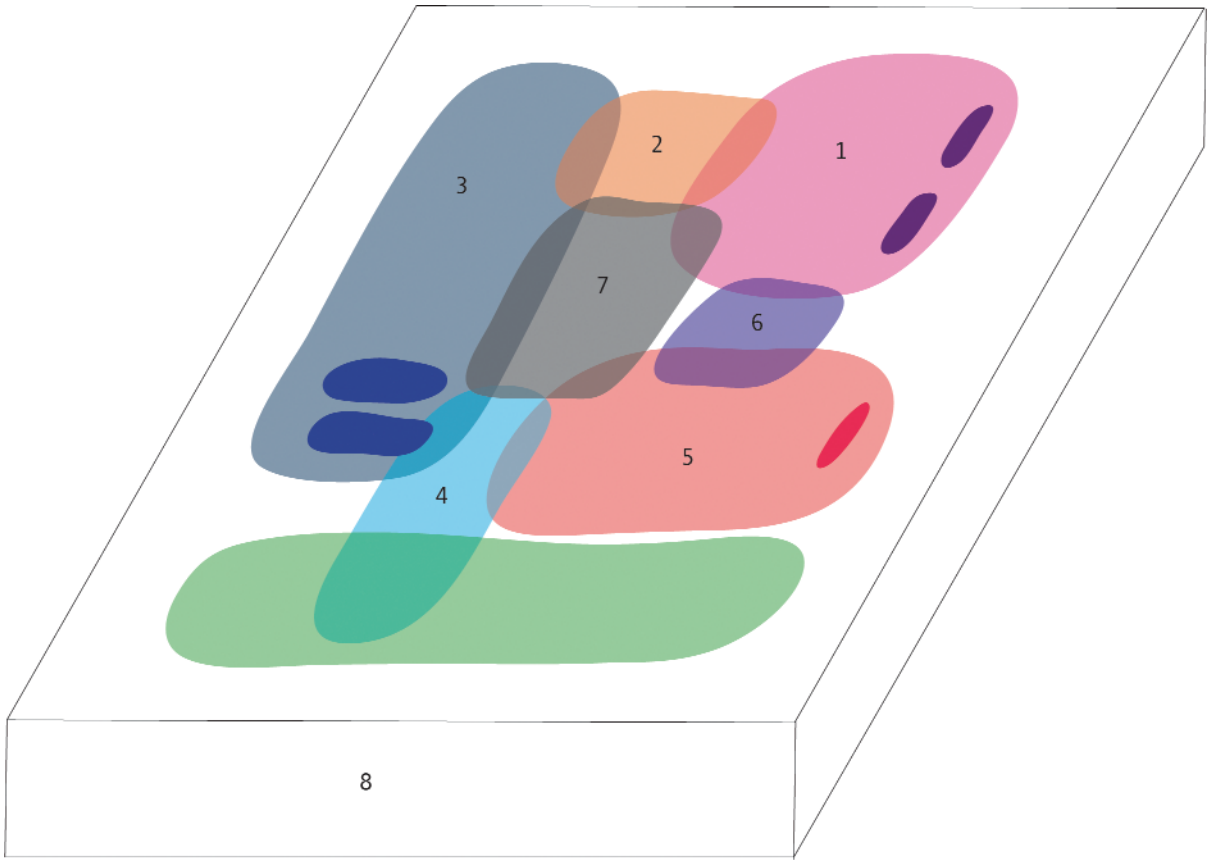
FIONA We used Jeremy Rifkin's book *The Hydrogen Economy*.[13] He suggested that energy production could be decentralized. Energy consumers could become energy producers, and local communities could produce their own energy. We imagined households as competitive producers, competing against their neighbors and needing to market their company and family brand. Everyone in the family might have to wear uniforms displaying the family logo.

TONY When a child reaches a certain age, say eight years old, instead of receiving a birthday card they get a contract which they have to sign, camouflaged as a birthday card. This commits them to producing a certain amount of hydrogen every week; of course any extra becomes pocket money.

FIONA You could actually say this is quite an ethical stance, as it makes children aware at a very young age of their energy liabilities, how each one of us, individually, needs to take on some responsibility.

■ Energy Futures, London Science Museum, 2004: hydrogen-producing family

Photo
Jason Evans



BioLand

1. IVF Land (Passion Conception Centre)
2. Clonetopia, BioBank, Utility Pets,
3. Immortality Inc
4. ForEverAfter
5. GM Love
6. Future Perfect (Prescription Pets, DNA Detectives, Counselling, and Toy Shop)
7. Clinic
8. Underground Laboratories

Consuming monsters: big, perfect, and infectious

In their biotechnology project, Dunne and Raby demonstrate how hard it is for everyone, even specialists, to grasp the implications of biotechnologies for our everyday lives.

FIONA When people participate in the biotech debate, they participate as citizens. They take a very philosophical point of view, saying, "Yes, this is right!" and "No, this is wrong." They argue very passionately about how the world should be in general terms, but when they step off their soapboxes into their everyday lives—washing the clothes, taking the children to school—they buy things that totally contradict their ethical or moral positions. Their behavior seems at odds with their beliefs.

TONY The aim of the project is to move the debate from the level of responsible citizenship to that of consumer choice. In this way we will be confronted with real desires. We may not wish to acknowledge them, but they will inevitably influence the shape of the future, whether we like it or not. We gathered together examples of biotechnology that have already entered—or are about to enter—everyday life in the form of products and services. We then mapped these onto a notional landscape called BioLand, an existential shopping mall, probably on the outskirts of some town.

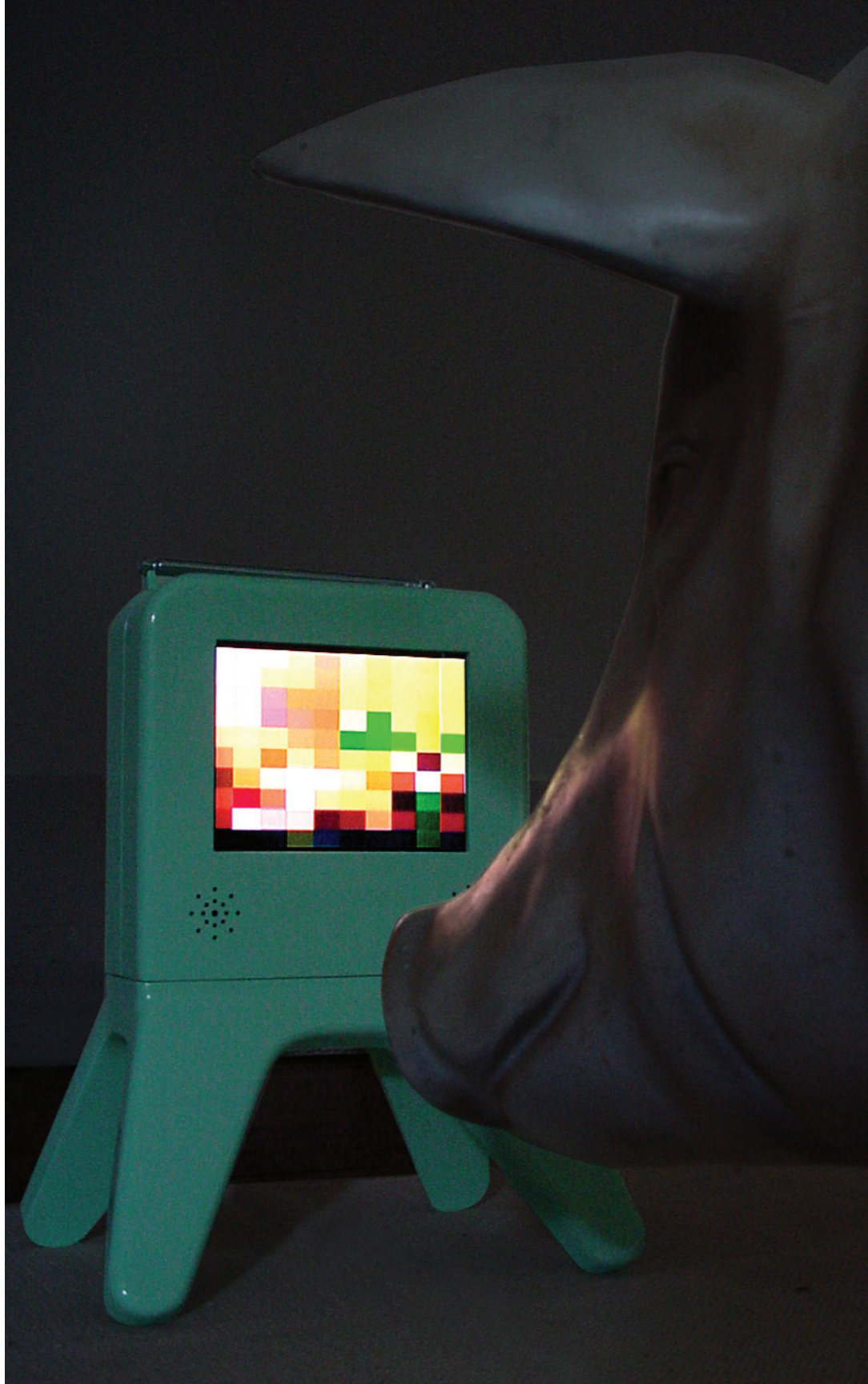
■ BioLand: an overview of the existential shopping mall concept

Illustration
Dunne and Raby

FIONA The idea is to use the planning and design of this new hypothetical mall and the qualities of the shopping experience as the debating ground.

TONY Essentially it's a big shed; the laboratories and storage will be underground, and on top sits a thematic consumer landscape, with departments called IVF Land, Immortality, and GM Love. In the center there is a hospital or clinic.

BioLand is a substantial project, with many products and services on sale. Tony and Fiona talk about Utility Pets as an example of the type of products that you might buy there: this was a project designed by Elio Caccavale, an industrial design master's student at the Royal College of Art.



Utility Pets

TONY Elio's project is about xeno-transplantation; using pig organs as replacement organs, your DNA can be genetically engineered into a pig, when it's an embryo.

FIONA So you have this little baby piglet with your DNA intrinsically part of its DNA. Who is going to be responsible for the well-being of your pig? Are you going to give that responsibility to a laboratory or pig home? Or would you want to take responsibility yourself? After all, it's your health; that heart growing inside the pig might eventually be inside your body. Does this mean that pigs may enter domestic space and become part of the family? Elio found out that pigs are very intelligent and that they love to watch TV, offering a perfect way to introduce pigs into domestic space.

TONY If you have these spare organs, that are being well looked after in this healthy pig, you may just as well enjoy yourself, and keep up your forty-a-day habit.

FIONA It really illustrates the separation between our actual behavior and our utopian delusions.

Utility Pigs, by Elio Caccavale.
- *Top and middle left*
  Smoke Eater
- *Bottom left*
  Pig Memento Mask
- *Right*
  Pig watching TV

Photos
Jason Evans

TONY Elio designed a special device which allows you to keep smoking in the same room as your pig, but stops the pig suffering from the dangers of passive smoking. So what happens when your pig has to donate its organs? What are the psychological pressures of grief or guilt? It has been known that people with transplants have dreams that come from the previous organ owners; would people suffer from pig dreams? Elio created a device that, when you wake up in the morning, reassures you that you are not a pig and are unlikely ever to become one.

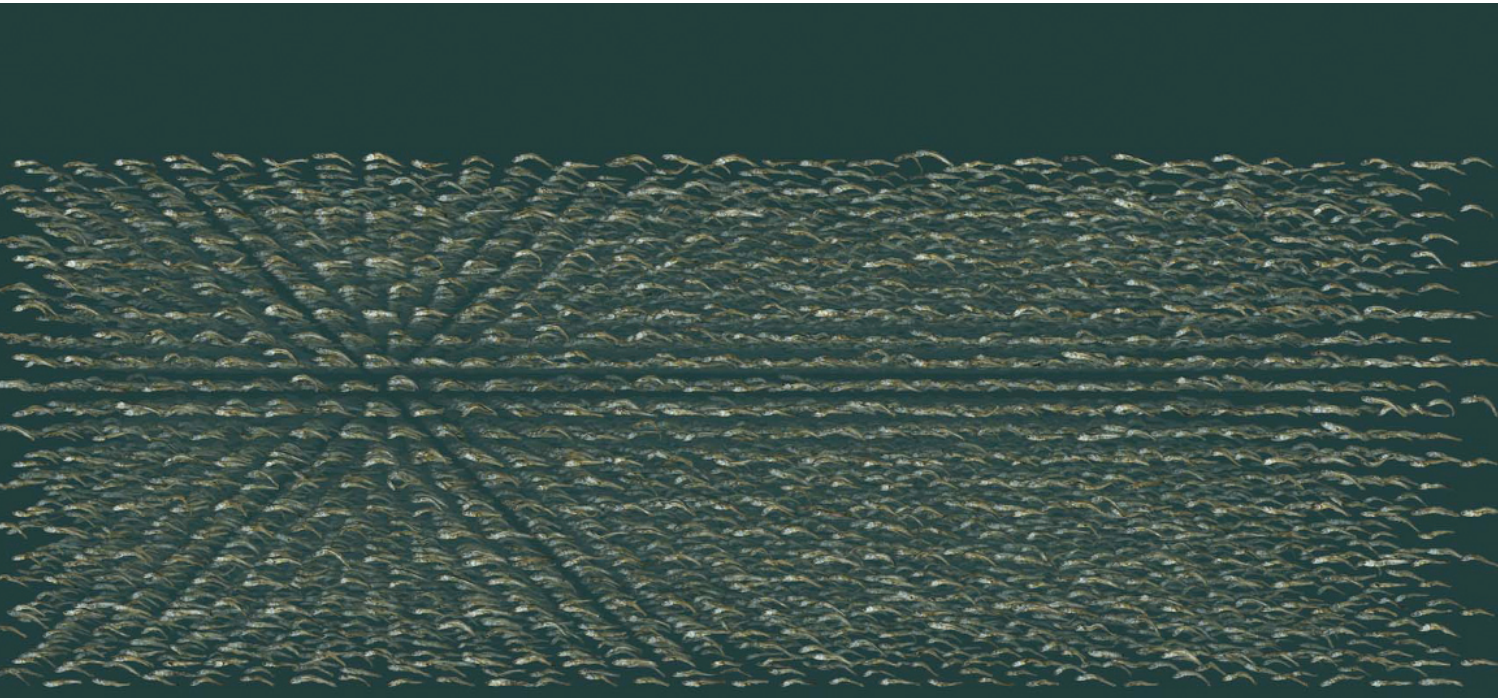
FIONA It puts you in touch with your friend, which now is an intricate and essential part of your body.

In contrast to Tony and Fiona's search for the subtle and emotional complexities of existential and ambivalent expression, John Maeda describes how he is searching for a new simplicity in the design of interactions in the future.

Photo Author

John Maeda

"Recently I placed some desktop patterns on my Web site that have found an enthusiastic audience. I made these images to celebrate 'food' as the letters F-zero-zero-D. Kind of cliché I realize, but nonetheless an enjoyable task of eating and creating." John Maeda had created these images for an exhibition that celebrated the sensual pleasures of looking at beautiful images and tasting delicious food, combined with whimsical social commentary. He seems boundlessly prolific, as an interaction designer, computer artist, and teacher; you can feast your eyes on his retrospective book *Maeda@Media*.[14] He was raised in Seattle, the son of Japanese immigrants who toiled for sixteen-hour days in their tofu factory. He demonstrated talents in both art and technical subjects. He studied engineering at MIT, and he followed his future wife to Japan, where he studied product design at Tsukuba University. His graphic design talent kept surfacing, and he found a niche creating work that was both artistic and technical, for example, the series of "Reactive Books," small-print pieces accompanied by software, about sound, time, the keyboard, and the mouse. Recognition started to arrive, with awards flooding in, including Japan's highest honor, the Mainichi Design Prize, and the USA's highest honor, the National Design Award. Soon he was a professor at the MIT Media Lab, directing the Aesthetics & Computation Group. He has recently made a fresh start with the Physical Language Workshop, plus an associated research initiative called "Simplicity." He has a variety of work archived online at his personal Web site www.maedastudio.com. There are some misconceptions that MAEDASTUDIO is a large company, but it is not; it is the name he gives his desk at home.



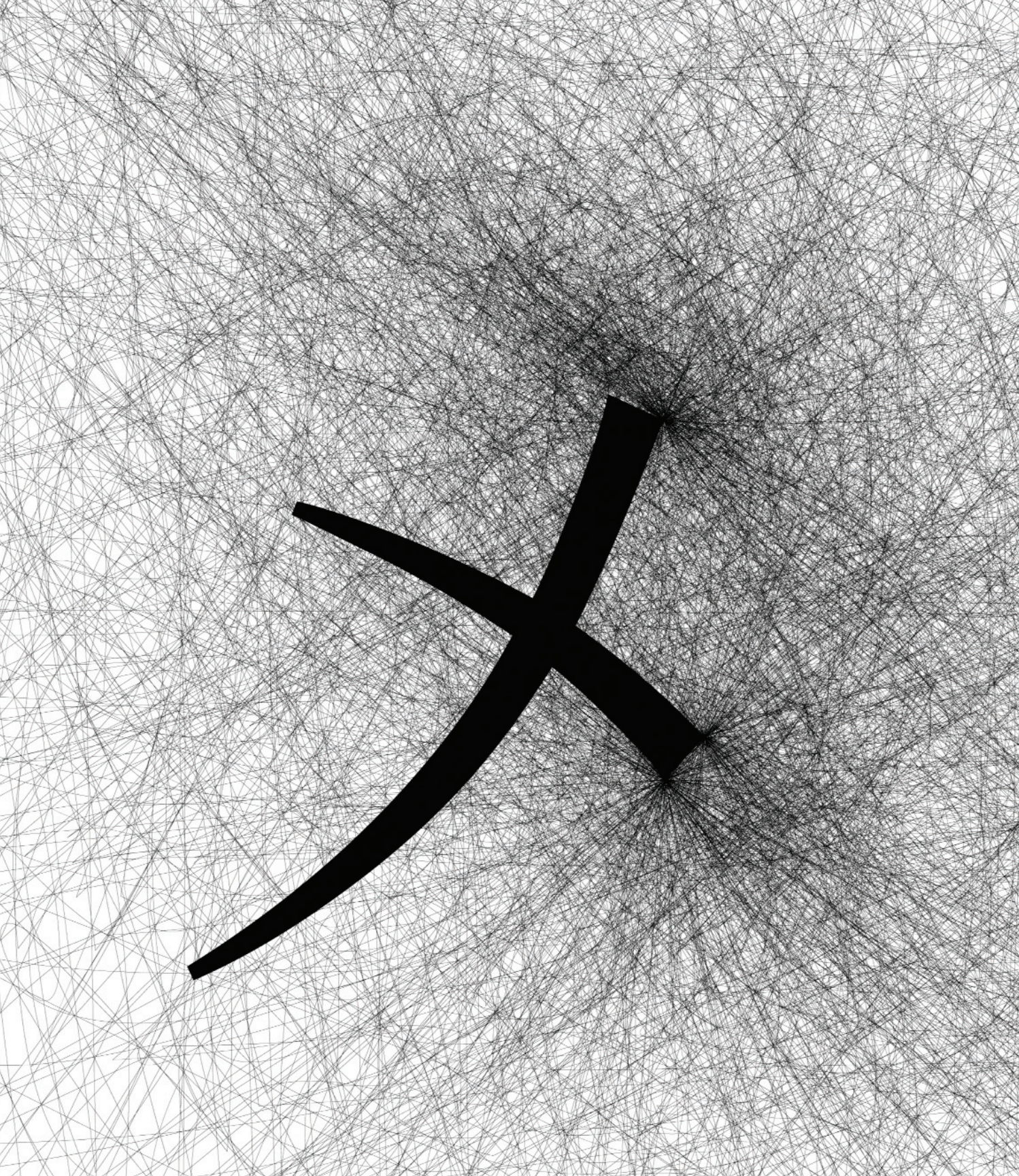
John Maeda

Dr. Maeda, an associate professor of design and computation at the MIT Media Lab and an award-winning graphic designer, has spent eight months putting forward his own one-word vision of the future: simplicity. There is too much needless complexity in the world, he argues. Technology, which was supposed to make our lives easier, has taken a wrong turn. In 20 years we've gone from the simplicity of MacPaint to Photoshop. While the first fostered a creative explosion, the second gave birth to an industry of how-to books and classes. And such complexity is commonplace, Dr. Maeda says. Despite the lip service paid to "ease of use," "plug and play," and "one-click shopping," simplicity is an endangered quality in the digital world, he adds, and it is time to break free from technology's intimidating complexity.

Jessie Scanlon, New York Times, May 20, 2004[15]

Images from FOOD Exhibition, 2003
- "Amber Waves" French fries
- "Rebirth" anchovies

Images
John Maeda



Simplicity

John Maeda came back to MIT as a junior professor in 1996. In Japan he had become very successful in graphic design and also in interactive design. He had been lucky to be advised by Naomi Enami, Japan's pioneer of interactive media:

> You are one of the few people in the world that can make these interactive things that are captivating and beautiful, but are they any good? How do you know they're any good if you have nothing to compare them with? You have to go into education to build the people who will one day come and destroy you.

John took that to heart, and spent seven years at the MIT Media Lab building the Aesthetics & Computation Group, which was devoted to redefining how media looked and felt, and thereby destroying John's predominance, as his students have graduated and become stars themselves. He started to wonder what to do next:

> I came to a realization that I could keep doing this. I could keep on making a unit that was able to create these people, but what if there was something I could do instead? What might that be? I kept asking myself, "What are the basic, most simple problems?"
>
> One of the questions that I've been recently faced with is the fact that digital tools today are too complex; they're too expensive; I have to buy all the upgrades. If I upgrade the OS, I have to buy all the software. These little bits of money are okay, but they're bothering me now, and I want to make a change.
>
> "How do you change it?" I was asking myself. Well, the answer may be by doing something that seems impossible, that is to rewrite all the software that is out there as simple, freely available, extensible modules that live on the Web. We already have a painting program, a photo-editing program, a drawing program, we're going to make a movie-editing program. It's basic, simple software, designed simply, engineered simply. And what this means, I hope, is that any school anywhere will be able to use this software in their own curriculum, free.

■ The final image in a series in which John Maeda manipulated the Japanese kana character for "me"—in this case by exploding one of its serifs

Image
John Maeda

■ Simplicity—Treehouse Studio applications

He argues that open-source software is not truly open unless people can access the code and easily alter it themselves. Even though John is a good C programmer, he is unable to extend or change Linux, in spite of the fact that it is called open-source. At time of writing in 2004, a group of his students are working on a basic technological infrastructure[16] for a kind of Bauhaus for the twenty-first century. The goal is to create a completely networked, interconnected system for visually and tactically oriented people who are constantly communicating with one another.

In order to provide connections to the new infrastructure, the team is building a gallery system for online exhibitions and a café to meet people:

> I don't like chat rooms, but people use them, so I thought, "What if we had a chat room about food? Virtual food." So in this system, I can meet people online in a restaurant; we can order food, we can click on it and eat it right now. People ask why would we buy virtual food? If I said Wolfgang Puck designed a pizza, you'd wonder, what is that pizza, so I think there is a possibility of selling virtual food online. Then you can imagine, again, different designers and artists from all over the world designing food for the restaurant and being able to sell the designs.
>
> Also we want to pour the bits, the visual landscape, out into the world in different ways. We are working on a flexible display system to display any geometry, and a physical conduit—this is very old-school stuff, basically a box that allows easy connection to the outside world—to make an open hardware specification for this kind of device.

John is influenced by the idea that core information connectivity is needed to provide the infrastructure behind the products that people actually come in contact with. He respects the iTunes approach from Apple for this:

> I remember I thought that Steve Jobs was kind of a fool, around 1999 or 2000, when he was putting in information-server services instead of new hardware. It was like, "Oh my god, he's making this iDisc, iWhatever, what an idiotic thing!"

But then I realized that—I'm not sure if it was intentional or not—he was building enterprise-class systems that were robust and secure. And because he had that base, he could do something like iTunes. He could embed the content into the player. Nobody could do that unless they had infrastructure for a global network. That's when I was thinking, "Well, that makes so much sense!"

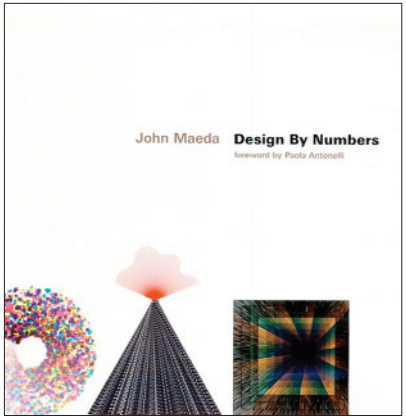
Members of the Physical Language Workshop are trying to re-architect how we draw on the computer, to get more people to understand it from basic principles. The MIT thinking used to be that programming was important and tools that allowed you to bypass the code were bad. Now John thinks that tools are good, but only if you are in control of them. Any good architect has to be able to sharpen a pencil by hand; in the digital world, there is no equivalent because everyone clicks the mouse the same way. The difference will occur in how the tool is held in the mind, which will mean that the programming of the tool is going to matter more. This appreciation of tools is deeply rooted in John's experience. When he first moved from MIT to the product design program in Japan, he recalls:

> It was a place where they were so behind; there were no computers. I liked that because it was so antitechnology. I began to sort of blossom because it was then that I realized, in all the drawing lessons and all that, that I couldn't "undo" anymore. It's an amazing thing when you realize that you've made a mistake, you're reaching for the "undo" command, but you can't. I sort of reformed myself there.
>
> I was doing product design in 1991, but at the same time I had very good friends in communication design and graphic design. We used to always hang out, so I would always bridge the gap. I would go to the different conferences and events and study product design but was also practicing graphic design as a hobby, and then I began to do very well all of a sudden. I began to achieve awards, get connections to really amazing teachers, and meet the design leaders in Japan.
>
> I came to the conclusion that product design was not going to be able to change very fast. I thought Mechatronics was very interesting, in products like the Bang and Olufsen stereo, which opens when you

Treehouse Studio applications ■

approach it as if by magic. I realized that there just weren't the parts there yet. There weren't the micro-motors, there weren't the sensor arrays we have now, and most importantly, there weren't these amazing embedded processing systems that we have now today. I didn't realize all these specifics, but I knew that, "Well, I can't do what I want to do in solid form yet, so why not just do it in graphical and virtual forms?"

I noticed also, especially in Japan, that many product designers had lost their mojo; maybe they had lost hope because there was someone in the States who had proven that industrial design wasn't working properly any more, and they had to do this new sort of cognitive science approach. I thought that a lot of people were headed down this very straight and narrow research-ish path. To me it's always been about the sort of passion of the whole activity, and that's why things like Bang and Olufsen are indeed magic. They aren't giving any specific affordances, but just have a magical moment, and I don't mind magical moments at all.



- Beosound 3200 with the magic doors
- *Design by Numbers*

John has created lots of magical moments for the people who enjoy his books and the archive of designs on his Web site. He works alone to create that material at his desk at home, with the support of his wife and four daughters. *Design by Numbers* was his first major book, published in 1999 by the MIT Press. He had thought for a long time that knowledge of programming was important for every young design student, because it shapes the digital landscape. He was thinking of writing a book called "Java for the non-Java inclined," to give people easier access to programming:

I went to buy a compiler or something, and tried to install it, and I couldn't get it installed. I realized how hard it is to program. Whereas, if you went back to the eighties, it was much easier to program because that's all you could do. You turn the computer on, it's blinking; it can do nothing unless you program it. People today don't have that experience any more.

Design by Numbers was an attempt to say, "Okay, what if I didn't like to program? I liked to draw and I wanted to learn how to program by drawing?" I wondered if there was a language for people who were more visually oriented than mathematically oriented, so

Design by Numbers was about simple premises. Your drawing area was 100 by 100 pixels; there was no color, it was only gray; all the numbers were from zero to one hundred. If you wanted a black square, you made it one hundred. If you wanted a gray square it was fifty, white was zero. Drawing on a computer is not hard, but it can be tedious. I led you through to the level that let you set the paper to a certain level of gray, set a pen to black, and draw a line, all with some numbers. With just those three capabilities you could sit and draw a picture of your friend using numerical expression.

You might wonder, "Why the heck would you do that, because it's much easier to draw it by hand?"

My point was, "If you can draw it by hand, draw it by hand. There are certain things you just can't draw by hand efficiently, so use the computer for those."

That was *Design by Numbers*. After I finished it, I was quite happy.

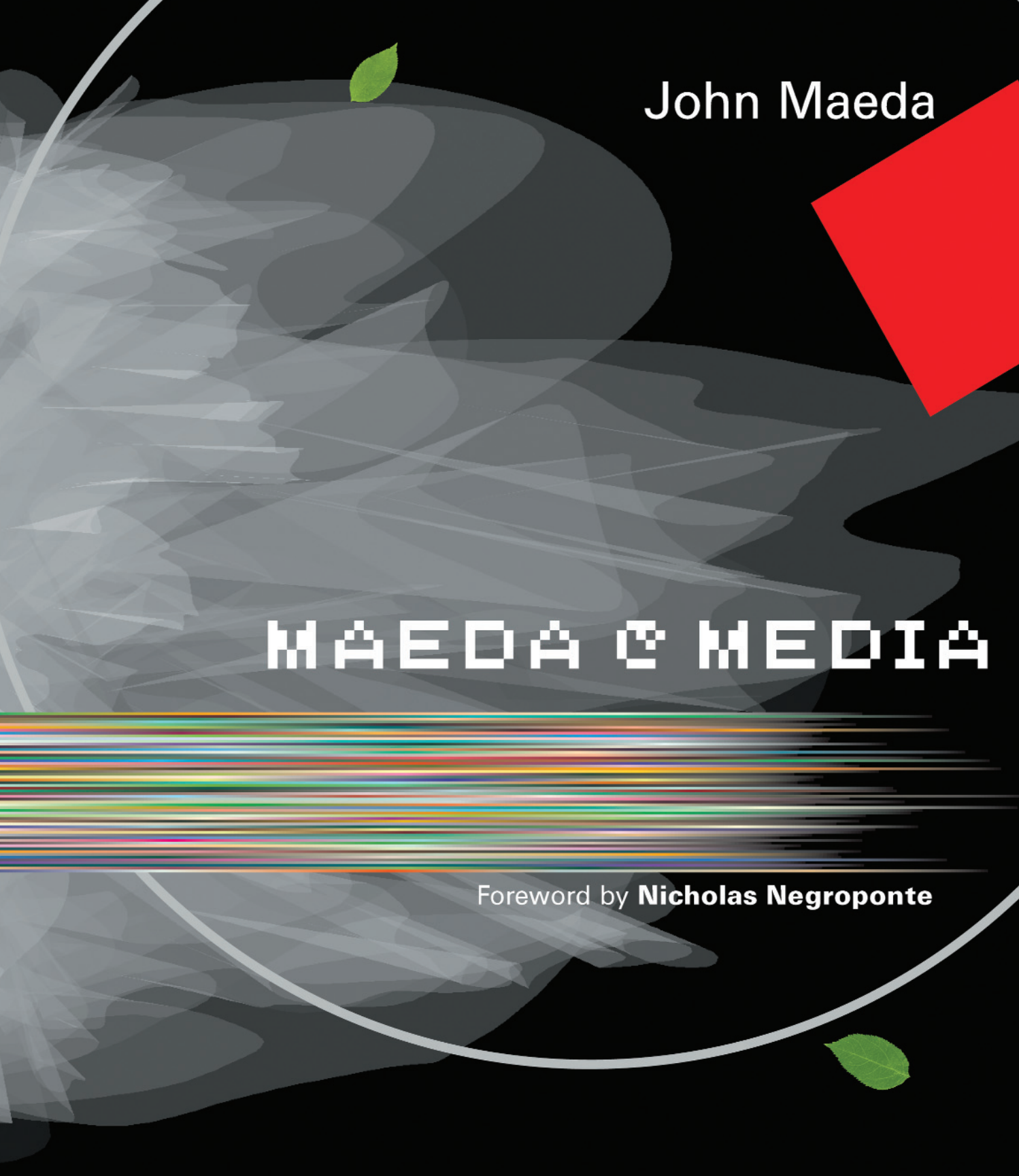
Almost immediately after he had finished, he was asked to write another book, this time a retrospective of all his work. His approach of working alone, writing and designing every page, made this a daunting task, but something in him drove him to agree, because he felt that only by making a full compendium of his past work could he free himself of it, and be able to think in a fresh way:

I embarked on this 480-page book for which I designed and created everything, and it literally brought me to a very bad point; I can never drink caffeine any more, because it has become very dangerous for me. Yeah!

It was good to do it. It's called *Maeda@Media*. It showed to me my own limitations, I think. This whole idea that I could play basketball and baseball and swim or whatever—I hit my extreme physical limitations. People like Paul Rand, they didn't actually design their entire books; they had assistants, staff, or whatnot.

When you browse through *Maeda@Media*, you can enjoy the design of every page for its perfect visual integrity relative to all of the other pages. This cohesiveness could only have come from the intensity of the single authorship, from many long days and nights with too much caffeine, when every choice of layout, font,

Reactive Books ■
Reactive Books display ■


John Maeda
MAEDA @ MEDIA
Foreword by Nicholas Negroponte

and color came from the same mind. The nature of the work presented in the book is very diverse and spans a long period of time, but you can feel a level of integration in the design that could not have been achieved by "assistants, staff, or whatnot."

This effort cleared Maeda's mind and allowed him to go back to first principles and think about "simplicity." His ambition is to create a new Bauhaus:

> In recent years, maybe recent means decades, many people have tried to bring back the idea of the Bauhaus in the digital realm, the Digital Bauhaus, reverse Bauhaus, I'm not sure. Everyone wants to bring it back. I believe it's important for there to be a moment of crystallization in this global creative community that we have, which happened in something like the Bauhaus. Why was it possible then? Why isn't it possible now? I'm not sure, but I've always thought it's because of physical constraints. I think the fact that there were fewer people working in the field, and, furthermore, family structures were different, I could say, "Goodbye family. I'm going to Paris to study painting for four years. See ya! I'll be back." You can't do that any more.
>
> The thing about the Bauhaus that cracks me up is that the early classes were taught by two instructors. One was the master craftsman, and the other was the master artist or designer, and the artist and the craftsman taught together. What happened is, as the Bauhaus created graduates, they began to hire their own graduates, but they weren't masters, they were junior masters; they were hybrids that could be both craftsman and artist/designer. Then they began to fire all the master craftsmen, because they were just people who make things, and they couldn't defend themselves in the political landscape. That struck me as a sad symptom of the triumph of politics over content.
>
> I think most people are attracted to the Bauhaus as an ideal dream; we humans crave to be inspired. I look to the Bauhaus as just one inspiring moment with many uninspiring things around it. Is it possible to build another inspiring moment in digital media? There has to be; otherwise, we should all just stop—pull the plug!

■ *Maeda@Media*
book cover

Image
John Maeda

John's idealism in putting together the Simplicity team is founded on the desire to educate at a basic level. He wants to create a new set of tools, freely accessible to children, which will help them develop the creative skills of artists and designers.

John Maeda's First Law of

simplicity

"A complex system of many functions can be simplified by carefully grouping related functions."

John Maeda's Second Law of

simplicity

"The positive emotional response derived from a simplicity experience has less to do with utility, and more to do with saving time."

> I'm putting all my ideas in a space of basic competency in the visual domain. In schools there's an emphasis on reading, writing, and arithmetic, developing a narrow aspect of your brain. There's nothing to test how creative you are! I'm trying to build these infrastructures to get more and more people everywhere interested in the idea that communication, expressed in a visual or tactile experiential way, actually enhances life, and that is something that won't be in our future the way things are moving, but I want to bring it back. I want to force that future to occur; gently, of course.

Will it be possible to reinvent the structure of software, to create basic software that is designed to be simple and engineered to be simple? It is an ambitious task for a small group of graduate students and a professor, however intelligent, accomplished, and dedicated they are. Perhaps it is impossible, but we will have to wait and see. Watch closely, because something significant is likely to emerge from the future of the Simplicity program. John is determined, even if he feels the need for a disclaimer:

> Well, about the future, I think that anyone who says they know the future is on drugs or something. I mean, I don't know what the future is; I don't claim to. I claim that we can make our own future, and I'm making that future.

While John Maeda is leading his little band toward "simplicity" by creating a new Arts and Crafts movement or a new Bauhaus,[17] in Tokyo a dedicated research scientist called Junichi Rekimoto is trying another kind of rebirth. He is building an Interaction Laboratory for Sony, akin to the Xerox PARC of the seventies, but more focused on pragmatic results for the many businesses of Sony. His future is more directly about enabling some of the promises of interactive technology that are emerging as outgrowths of the main flow of innovation. In the interview that follows, he describes the work of his group at the Computer Science Lab (CSL).

John Maeda's Third Law of

simplicity

"When the richness of an experience is increased in a manner that facilitates the perception of the overall intent, but all means don't skimp. Add more!"

John Maeda's Fifth Law of

simplicity

"A material's failure to comply to a specific application provides indication that its more natural usage lies elsewhere."

John Maeda's Seventh Law of

simplicity

"The more care, attention, and effort applied to that which is less, the more it shall be perceived as more than it really is."

John Maeda's Fourth Law of

simplicity

"The more you know about something beforehand, the simpler it will ultimately be perceived."

John Maeda's Sixth Law of

simplicity

"In order to 'feel,' you gotta have noise. Too much noise, and all you've got is noise."

John Maeda's Eighth Law of

simplicity

"Recognize not only the absolute laws of the physical universe as important constraints, but also the artificial laws as of equal importance when striving for simplicity."

Photo Author

Jun Rekimoto

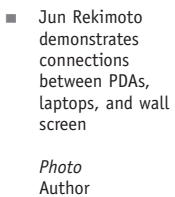
"My name is Jun Rekimoto, and I am working on the interface of the future, and I am also directing the Interaction Laboratory in Sony Corporation. When I was a high-school student, I was quite impressed by the Xerox PARC work, especially Alan Kay's article in *Scientific American*,[18] and then I decided I wanted to go into this field." Sony Computer Science Laboratories (CSL) was established in 1988. It is tucked into the Tokyo cityscape in an unobtrusive office building, just a few minutes walk from Sony headquarters. The intimate connection been the lab and Sony development is more than physical; CSL has produced a stream of research that is pragmatically connected to the business of the company. Jun seems young to be running the Interaction Laboratory, with a dozen researchers and designers in his group, but he speaks with authority and thoughtfulness that makes you immediately appreciate his leadership qualities. He studied at the Tokyo Institute of Technology, but his first experience with computer programs was at the age of ten. He worked for another computer company in Japan for about eight years, and then moved to Sony, establishing the Interaction Laboratory in 1999 to investigate the future of human-computer interactions and digital lifestyles. He is interested in designing interactions for portable computers, situated in the real world and augmented by computer-based information. He envisages the ability of the computer to assist the user without having to be directly instructed. Before the end of the decade, he expects that such computers will be as commonplace as today's Walkmans, electronic hearing aids, eyeglasses, and wristwatches.

Jun Rekimoto

Recent progress in hardware technology has brought about computers that are small enough to carry or even wear. These new computers, however, preclude traditional user-interface techniques such as a graphical user interface (GUI) or desktop metaphor. To overcome these shortfalls, human computer interaction (HCI) technology is rapidly changing, resulting in a transition akin to the switch to GUI in the 80's.

Dr. Rekimoto's Web site[19]

The Interaction Laboratory



Jun Rekimoto demonstrates connections between PDAs, laptops, and wall screen

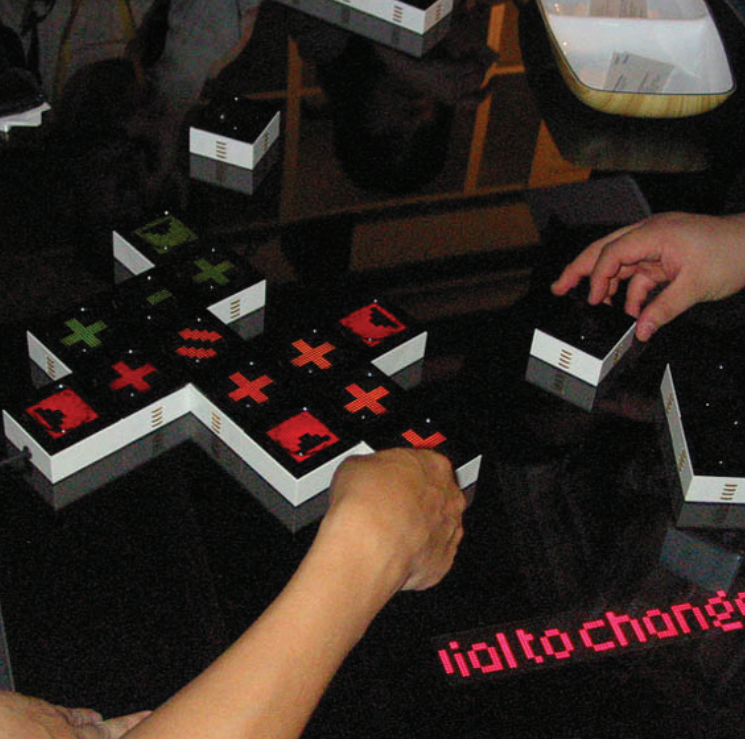
Photo
Author

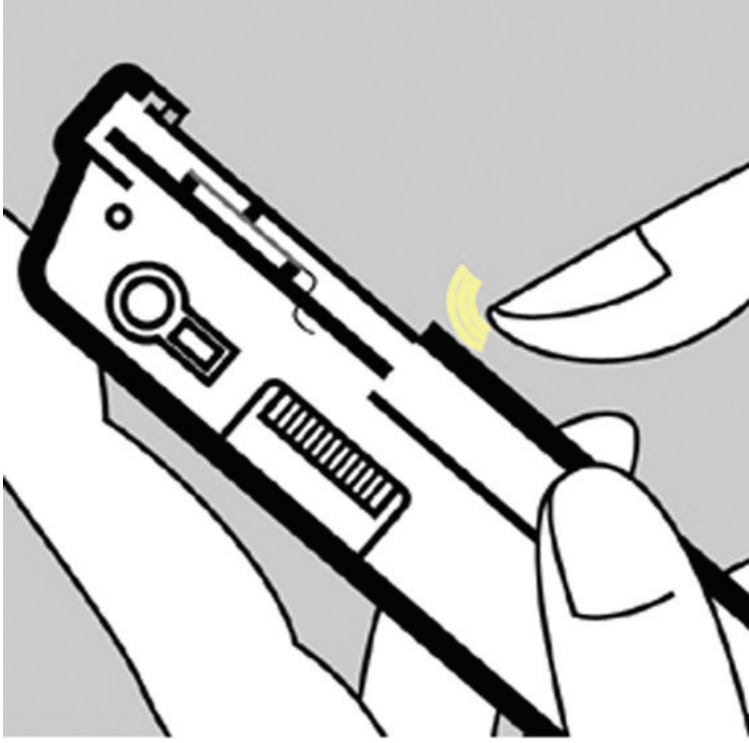
The Interaction Laboratory is full of prototypes. The large central space is dark enough to allow the contents of electronic displays of all types to be easily seen, but with enough ambient light so that furniture and objects are also visible. Jun Rekimoto and his team of researchers have individual offices behind frosted glass walls, so that you can see through them to the glow from the external windows beyond. As he takes you around, demonstrating prototypes, introducing his colleagues and explaining his ideas, there is an unmistakable air of excitement and feeling of energy.

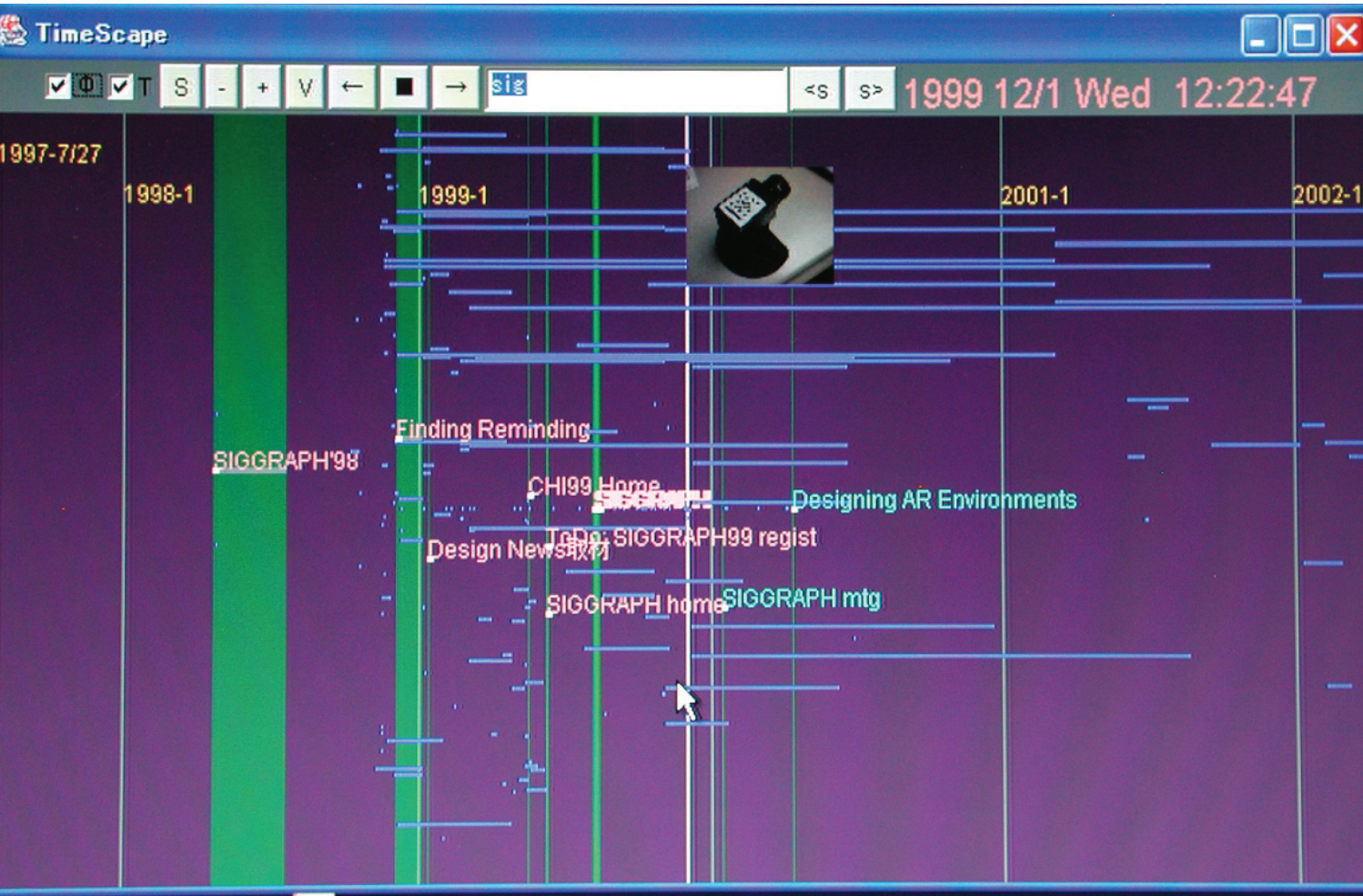
The work of his Interaction Laboratory scratches the surface of the future while at the same time staying connected to the realities of the present. Here are his descriptions of summaries of four of the projects:

ActiveInk computational ink[20]

> Perhaps you are asked to create a very complicated three-dimensional scene, using a sketch interface. ActiveInk is computational ink, which



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means that if you draw a picture and want to draw a sky, you want to use blue paint and maybe mix in white paint. This is the traditional way, but with this system you can use sky ink. It has the ability to do sky. If you paint with this ink, a cloud will emerge automatically, or you can mix sky ink with fire ink, and you will see different types of surfaces.

BlockJam interactive music cubes[21]

This interactive music toy system is made up of modular cubic-type blocks. When you put the blocks together, the music can be changed according to the physical configuration. Each of the types of cubic object has a connector, and each cube has a computer, so you can snap them together and create a configuration, like Lego blocks, and the system understands which blocks are connected. Each block has several functions, such as timing or rhythm, or changing sound, so if you create a differently shaped object, you get different types of music. This gives a tangible interaction interface to invisible information such as music.

You can become a composer; one box can do a simple rhythm, but you can combine with other boxes, the resulting rhythm is much more complicated, so you can get infinite kinds of music sequences.

- *Top left* BlockJam interactive music cubes
- *Top right* TouchEngine touch panels
- *Bottom* Time-Machine Computing navigation system

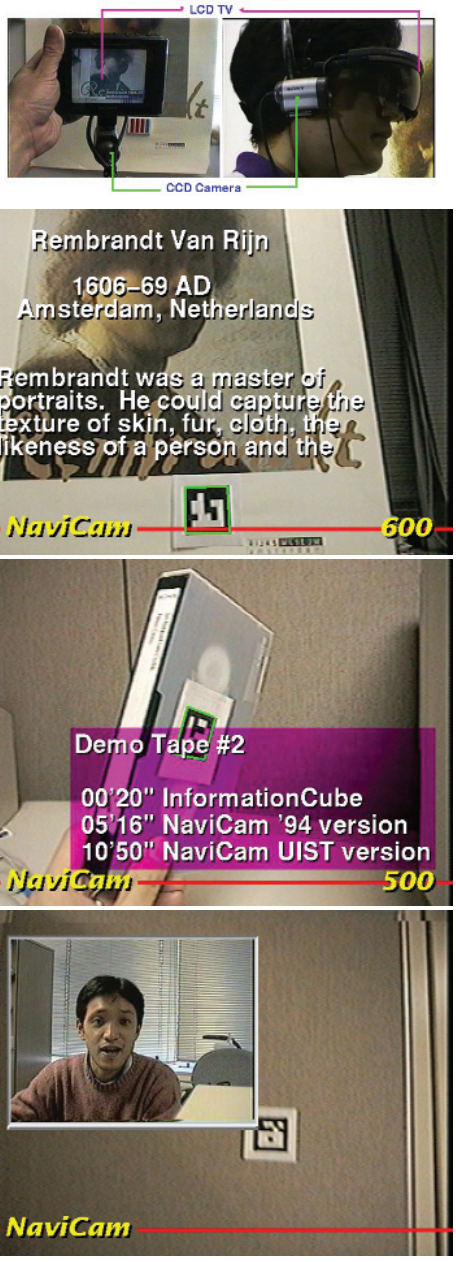
Photos Courtesy of Sony CSL

TouchEngine tactile feedback for touch panels[22]

If you press the glass surface of a touch screen normally, you cannot feel anything, and only sound or visual feedback is available. With this tactile feedback system, a very small actuator vibrates the surface of the glass, so that you can sense a subtle feeling on your finger. It feels almost like pushing a physical button, so this is a tactile interface. The feedback is programmable, so stronger feedback and weaker feedback could explain the various system situations.

Time-Machine Computing navigation system

His fourth example is a project to look at alternatives for organizing information and the possibility of escaping the tyranny of hierarchical folder structures, which are difficult for novice users to navigate. If you take a picture for example, it may belong to a particular project, or it may belong to a photo album, so the same object belongs to two or more categories. Rekimoto and his



■ Using NaviCam

team have chosen time as a concept for organizing information, so that the computer archives all the activity and lets the user go to any point in time. This means that if you want to look at documents from yesterday's meeting or last year's meeting, you can simply go to the date of the meeting, and you will see your desktop as it was at that time.

> Time is the most universal type of information available. If you take a picture, the photo album or the JPEG file will have the time information, and if you create a document, it also has a modification time. So if the system allows you navigate using time, you can find the document. You can also find a picture that is close to the document's creation date. So you can browse through only using time. And there is almost no cost to archive such time information. The other possible information such as location is rather difficult to always capture with currently available technology.

Augmented Reality

When Jun Rekimoto first joined Sony CSL, his research centered around augmented reality. He developed the NaviCam system, consisting of a small handheld computer with a camera and the ability to recognize barcode markers in the real world. It was capable of reading symbols and obtaining information and then providing information back to its user. Here is a quote from a *Business Week* article about it:

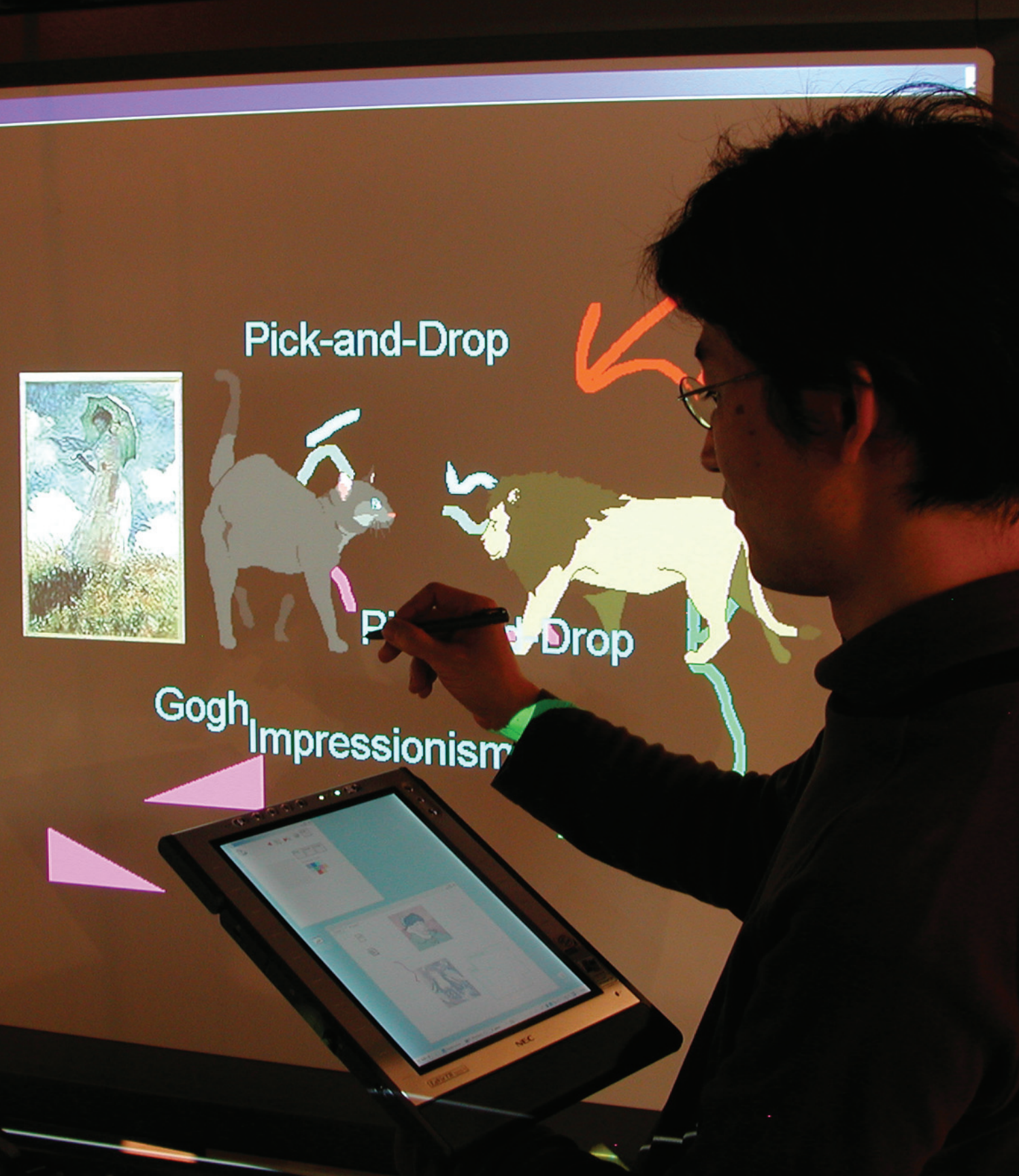
> It took a few moments before I could get the camera on Sony Corp.'s next-generation personal digital assistant to lock onto the bar code outside an office at Sony's Computer Science Labs. But once I did, the Navicam device came to life. Almost instantly, the top half of the display showed the name and photograph of the researcher inside. Below, I could read a description of his research interests. For more detail, I scrolled down the screen with a pen-input device. Another button let me switch the display from English to Japanese.

> NaviCam is the first version of a new product category: smart portables that sense their surroundings. Wandering the spacious halls, I could learn what scientists were up to without disturbing them. And if I wanted to find a particular office, the Navicam led the way.[23]

The narrow definition of "augmented reality" is that the real view that someone sees is augmented by a computer-generated overlay of some kind, so three-dimensional matching is needed. Rekimoto thinks about it more broadly, suggesting that it encompasses any computer that can be aware of the real-world situation, such as location or nearby people or objects, and then create useful information, which is given back to the user. He emphasizes the opportunity based on location:

> One of the most important situations is location, and there are a lot of different technologies—such as GPS or WiFi beacons—that are available. I think in the near future all mobile devices will be aware of location and will create person-centric information. Maybe the boundary between the telephone and the small mobile computers will be very vague. Maybe there will be a mixture of PDAs and telephones, because cellular phones are a very closed system, and we cannot create exciting applications without permission from the telephone carrier. On the other hand, PDAs are real computers, so we can create any application, but there is no wide-area connectivity. Maybe in the near future, IP mobile telephones can be a promising technology, and we can create a completely open-ended cellular phone, like a computer and a cell phone.

The small size of a cell phone is very significant in making it attractive to carry. Compare the huge brick of the early models with the continuing tendency to develop smaller and smaller phones; each generation seems to shrink, even when the smaller area available limits the sizes of buttons and screens. Jun Rekimoto therefore accepts that people will continue to want to use small screens, so in order to realize his vision of ubiquitous computing, he is searching for ways to leverage connectivity, allowing cell phones to seamlessly connect to other computers with larger displays, converting themselves into pointing devices and input or information transfer devices.


Pick-and-Drop
Gogh
Impressionism

Ubiquitous Computing

Pick-and-drop

At the moment, if you have a PDA and wall screen or desktop computer, it is not easy to create a connection between them without checking an IP address, or doing something similarly technical. Jun has invented pick-and-drop as a more direct way of transferring information from one platform to another, so that you can simply pick an object up in one computer and drop it into another:

> I first used three different types of computers, Macintosh, Windows, and UNIX, so I had to use three mice on my desktop, and also three different keyboards. This was very, very complicated. I suddenly thought about why I have to use three mice. When I am dealing with physical papers, I only have to use one pencil for different kinds of sheet. If a particular pencil in the real world were connected to a particular piece of paper, the world would be very complicated.
>
> For the computer, it is assumed that the user has just one computer, but soon we will be using many different kinds of computers, so the fundamental design is different. So then I created a pen-operated computer, which allows the user to only handle a single pencil (stylus) using multiple computers.
>
> I am an Asian person, so I am very accustomed to using chopsticks. I can use chopsticks to move food from one dish to another, so I wanted to do a similar interface in the computer environment.

■ Jun Rekimoto demonstrates pick-and-drop

Photo Author

The demonstration of pick-and-drop in the Interaction Lab allows you to use a stylus to select an icon on one computer, which then disappears from the screen. When you tap on the screen of another computer, the icon appears on that screen and the file has been transferred. It works like "cut" and "paste," but it feels more like the file was virtually attached to the stylus than to a virtual clipboard.

> We want to grasp digital objects—such as icons from the computer screen—to hold them in the real world, so I use a kind of gesture

that tells the system that I want to pick up this information. It is invisible, but I can conceptually think that I am holding the digital object. Then I can go to any other computer and gesture again by tapping to release the object.

I remember that I am holding it using my short-term memory, so it is not a practical idea to pick up an object in Tokyo and drop it onto a computer in New York. We can also think about a stylus with a tiny display, so I can look at what I am holding, or maybe a sound, or small vibration can indicate the object is here.

Maybe a small computer—such as a cellular phone—can be acting as a pointing device for the nearby environment. You can make a cellular phone call, attach to a nearby screen, pick up some information, and then drop it onto another computer. This small cell phone-computer can also act as a remote controlled mouse.

This drag-and-drop approach is much more direct than anything we use today between separate devices. Even a memory stick requires several steps to transfer the data.

Jun believes that in the near future people will be using combinations of multiple devices, posing a challenge for interaction design, as most interfaces so far have been designed in the context of a single computer. He thinks that it will be possible to build on the concept of direct manipulation across platforms, leveraging the familiarity with drag-and-drop that people have experienced with the graphical user interface:

I think direct manipulation is still very important, even for the ubiquitous computing environment, because we are directly manipulating physical objects, and the GUI takes this metaphor into the digital world. In the near future we can live in a mixture of digital space and physical space, but still I think that directness is very important.

A computer must be aware of the surrounding environment or location or any other objects, so it must sense the situation and know how to behave, maybe automatically, based on the situation. So this is not a totally direct concept, but I think the mixture of directness and context-sensitive computing is the future.

For example, if you want to do a presentation in an unfamiliar conference room, you have a cellular phone, and you simply approach

the screen, and the screen automatically becomes your presentation screen, and you can control the presentation material without any command structure, but simply by using your cellular phone. All of the necessary network connection or security establishment can be done automatically by sensing proximity, because you are very close to the screen. This is maybe the simplest example.

Gestural interfaces

Gestural interfaces are likely to be a preferred form of input. As well as the use of gestures for pick-and-drop, Jun Rekimoto is developing a finger sensor, so that a table surface can be aware of your hand motion without your touching it, using a very weak radio field around the table. You can imagine a world of augmented reality controlled by gesture. For example, if the message from a restaurant is irritating, you turn it off with a subtle "cutting" motion of the hand. You can tell a store with bad advertising by the fact that people are making little cutting gestures as they walk by.

We saw efforts to develop gestural input languages with the early tablet computers and PDAs described in chapter 3, "From the Desk to the Palm," but the Go and Momenta computers and the Newton were all ahead of their time, so it is hard to know if the gestural aspects of their design will prove successful in the future. Stu Card has thought about the underlying interactive potential enough to articulate an opinion about gestural interfaces:

> The problem with gestures is that they require recall instead of recognition. You have to be able to remember all the gestures, so you need to make a rule that, though it's okay to use gestures, you can only have a small universal set.
>
> Another rule is that the gestures should be mimetic rather than symbolic. It's okay for me to have a gesture that says I want to move this book over into the bookcase here, or I want to make it go farther back in the space. For example, if I take this book, put the mouse over it, and flick it in this direction, that will send it back one tier into the space; that gesture is a mimetic abbreviation of what I would do if I was carrying it all the way back and placing it on the tier. It's not a symbolic thing that has an arbitrary meaning to it.

> If we build a gestural language like that, we can build a system in which we can very rapidly manipulate items around a world, and in which you can very easily remember what all of the commands do. In a gesture of this sort, we combine the specification of the argument and the specification of the command in a single stroke. I can't think of how you could get any faster than that.

Ubiquitous computing enabled by sensors and receptors

Jun Rekimoto forecasts a near future in which everyone emits some kind of signal or carries some kind of sensor, so that our personal preferences and messages travel with us, and the environment is able to adapt to us in a way that we choose. Similarly, he predicts that the environment will emit local information, so that stores or restaurants are telling us about themselves and can be interrogated if we wish.

Simply by moving around, we will automatically get access to information, between ourselves and other people, as well as between ourselves and the places that we are near. Durrell Bishop describes a scenario of an augmented environment with a similar vision of the future:

> Imagine that John walks into a shop looking for holiday. He looks through a brochure and he sees something he's interested in. "Ah-ha, a holiday in Turkey." He takes out his reader and it transmits just locally. He strikes the holiday with his reader, and then chooses a screen to view it on. Here he is picking a tagged object—an augmented book—that has been broadcast to the shop. The shop may have got the data locally, or it may be going to Turkey to the hotel to find the data, and put it up on the screen. John feels that he has a tool with him that lets him get at augmented objects, at the digital world behind things, and lets him connect together material and outputs.
>
> In another example, John is walking down the street and looking for a flat. He goes down to the newsagent, he looks in the window, and he sees some flats for rent. He takes out his reader and strikes the card in the window. Looking at the screen inside the shop, he now sees pictures of the flat.
>
> I believe that this is the sort of thing that is beginning to happen, and I know of examples where people are trying to find the equivalent of HTML for physical objects.

Durrell Bishop's scenario meshes perfectly with the research direction that Jun Rekimoto is following, and they are both building prototypes of these ideas that they are passionate about. Their vision of the future also follows the path toward ubiquitous computing advocated by Mark Weiser and described by Terry Winograd in chapter 7, "The Internet." This all combines to indicate a way forward that connects the physical and digital, and offers us the chance to design interactions that are full of the richness of form and movement, freeing us from the feeling of being constrained by our computing devices.