Touch

Designing new interactions for mobile technology

What I want to do with this talk is to give a bit of an insight into an in-progress project that deals with the design of new mobile technologies.

To give you some varied ideas of where our inspiration is coming from, what our intentions are, and what we are doing day to day.

There are only a few big ideas here, most of it is practical and down to earth stuff, which I hope gives some inspiration and insight.

1. Trends and patterns in mobile interaction
2. Insight into our mobile design work

So my talk is loosely divided into two parts.

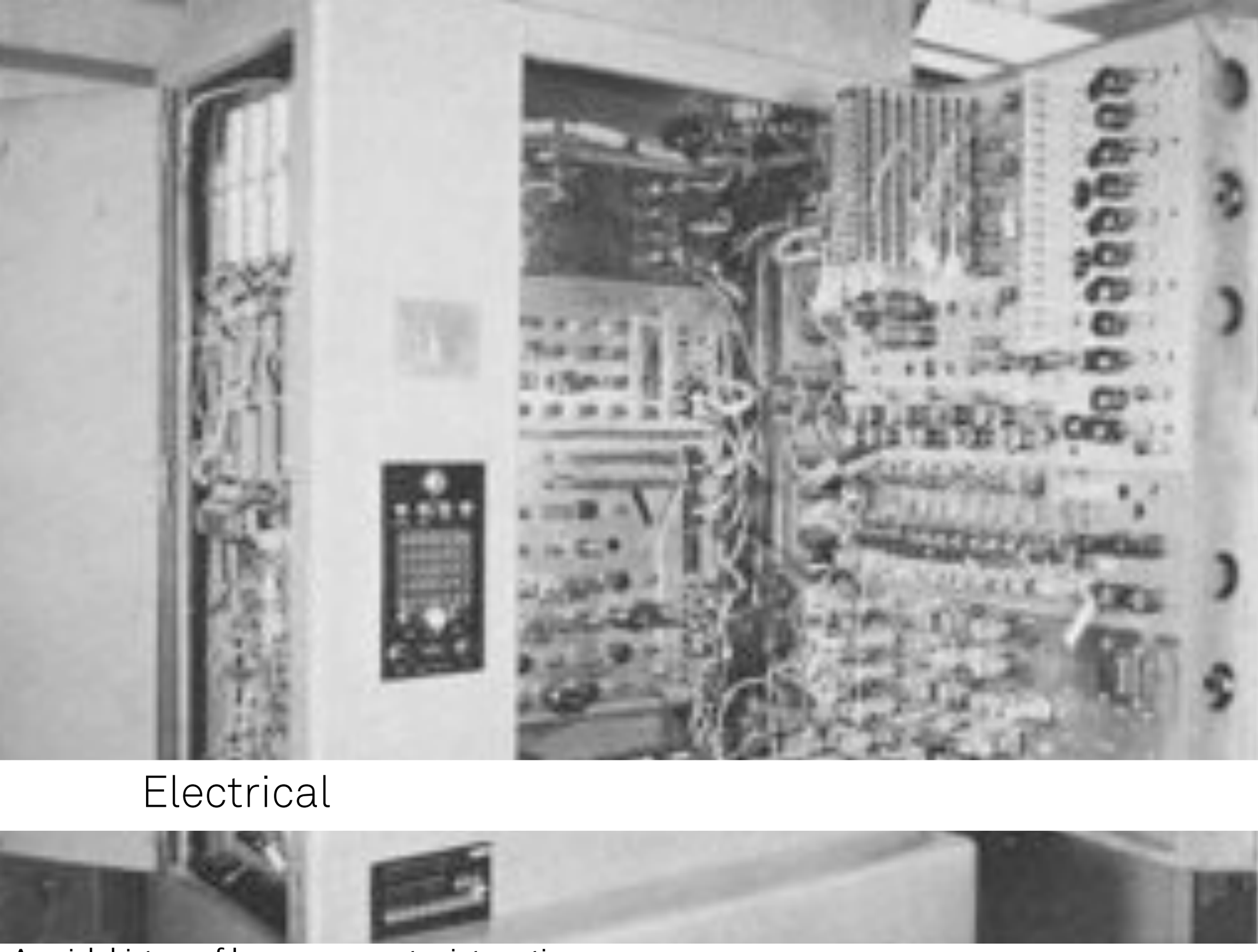
I'll start by talking about things that we think are interesting.

Then I'll go on to look at a bit of detail about our project.

1. Trends and patterns in mobile technology

Where are computing and mobile technology coming from?

And what are the current interesting trends/patterns that we can use?



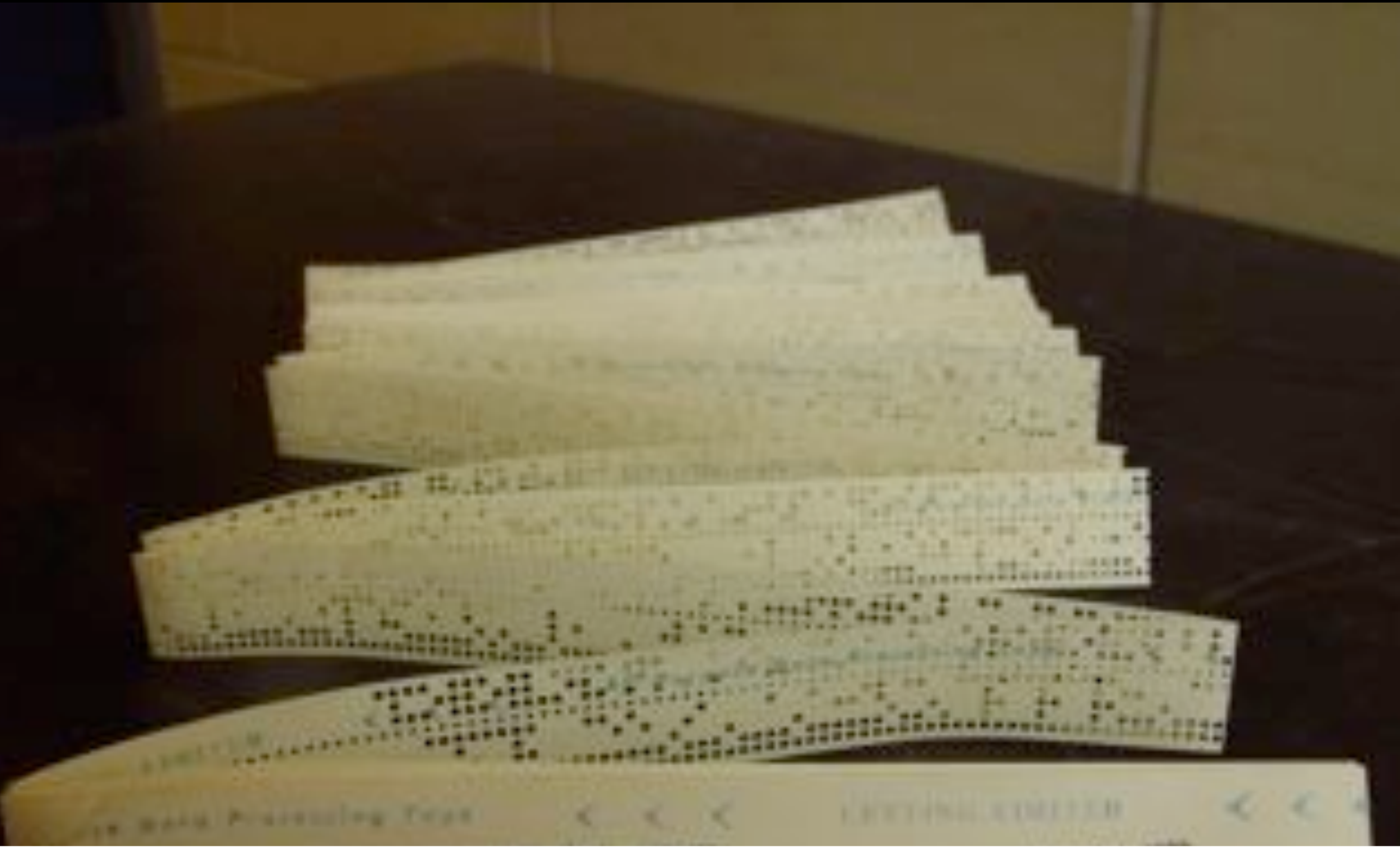
Electrical

A quick history of human-computer interaction.

There is a researcher called Paul Dourish that has put together a nice structure that helps us to place ourselves in the recent developments in computing.

- electrical: required a thorough understanding of electrical design

Computers weren't very conversational



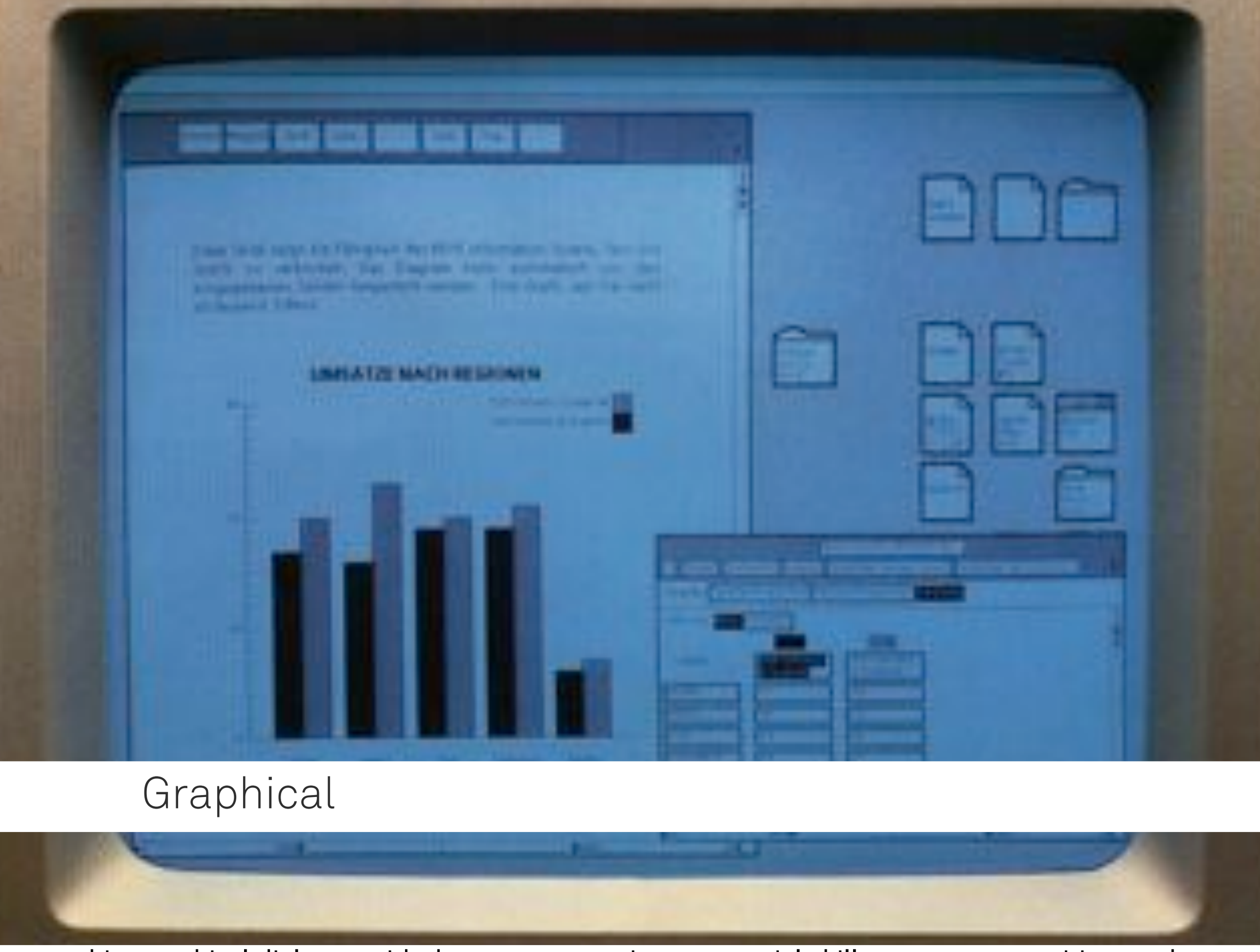
Symbolic

- symbolic: required a thorough understanding of the manipulation of abstract languages

Textual

- textual: text dialogue with the computer: set the standards of interaction we still we live with today

At each stage of development, Dourish argues that the interactions make more use of human skills and abilities.



Graphical

- graphic: graphical dialogue with the computer, using our spatial skills, pattern recognition, and motion memory with a mouse and keyboard

- Electrical
- Symbolic
- Textual
- Graphical
- ?

And we have become stuck in this model, Interaction has remained largely the same: desk, screen, mouse, etc.. What next?

- Electrical
- Symbolic
- Textual
- Graphical
- Tangible and social

Tangible and social

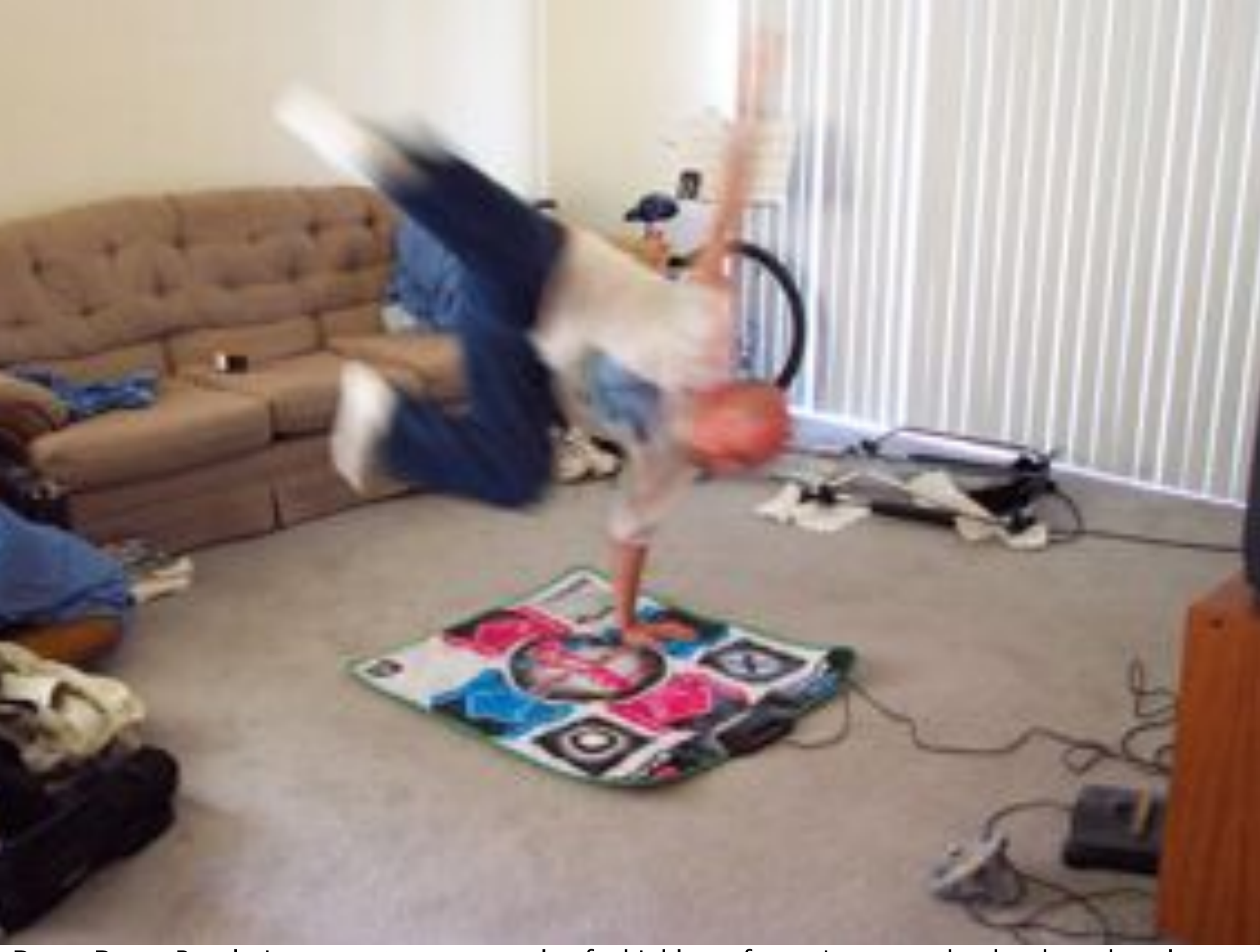
• Tangible: physical: having substance or material existence; perceptible to the senses
• Social: human and collaborative abilities, or 'software that's better because there are people in it' (Definition from Matt Jones and Matt Webb)

The first area that has shown the greatest potential of tangible and social computing is gaming and play

Nintendo DS and Nintendo Wii introduced many tangible and social elements into gaming.

The DS features a touch screen and a microphone, that Nintendo managed to get a lot out of (games feature blowing and shouting)

The Wii tracks motion in time and space, allowing for a whole range of new games to be built (and anyone who plays it will attest to the fact that it’s much less fun to play alone, showing the interrelatedness of the social and the tangible)

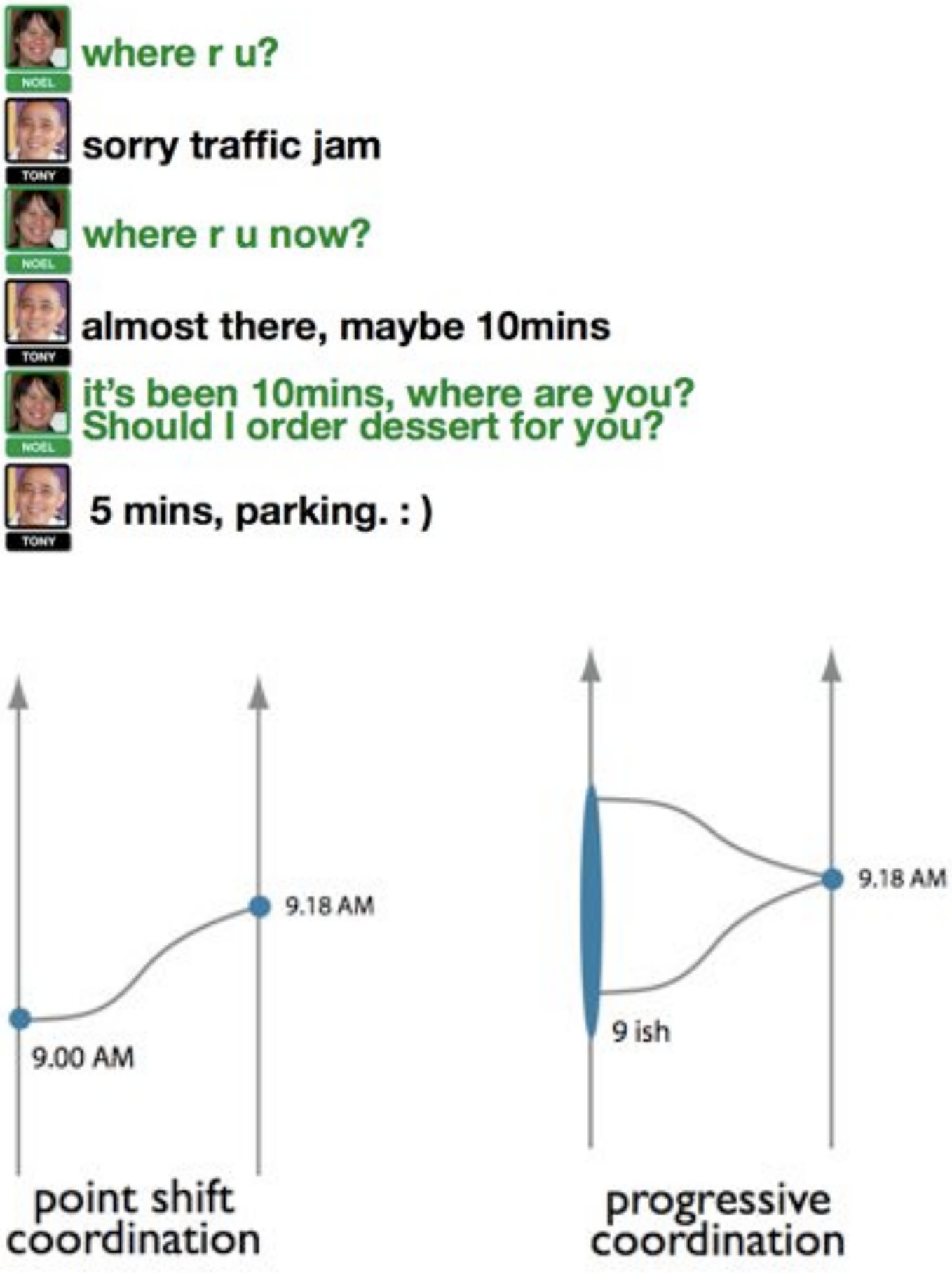


Dance Dance Revolution, an extreme example of a highly performative game that has been hugely successful.

We are now about four years into this mass-marketisation of tangible games. The patterns of interaction have been set, people are getting used to this kind of interaction in everyday settings.

So I wanted to look a little at ways in which mobile services have re-configured our sense of time.

SMS is an example of a very simple infrastructure that has been adopted in ways that were rarely designed.



A project at IVREA called fluidtime looked at the behaviours around SMS and designed services that built upon our changed concept of time.

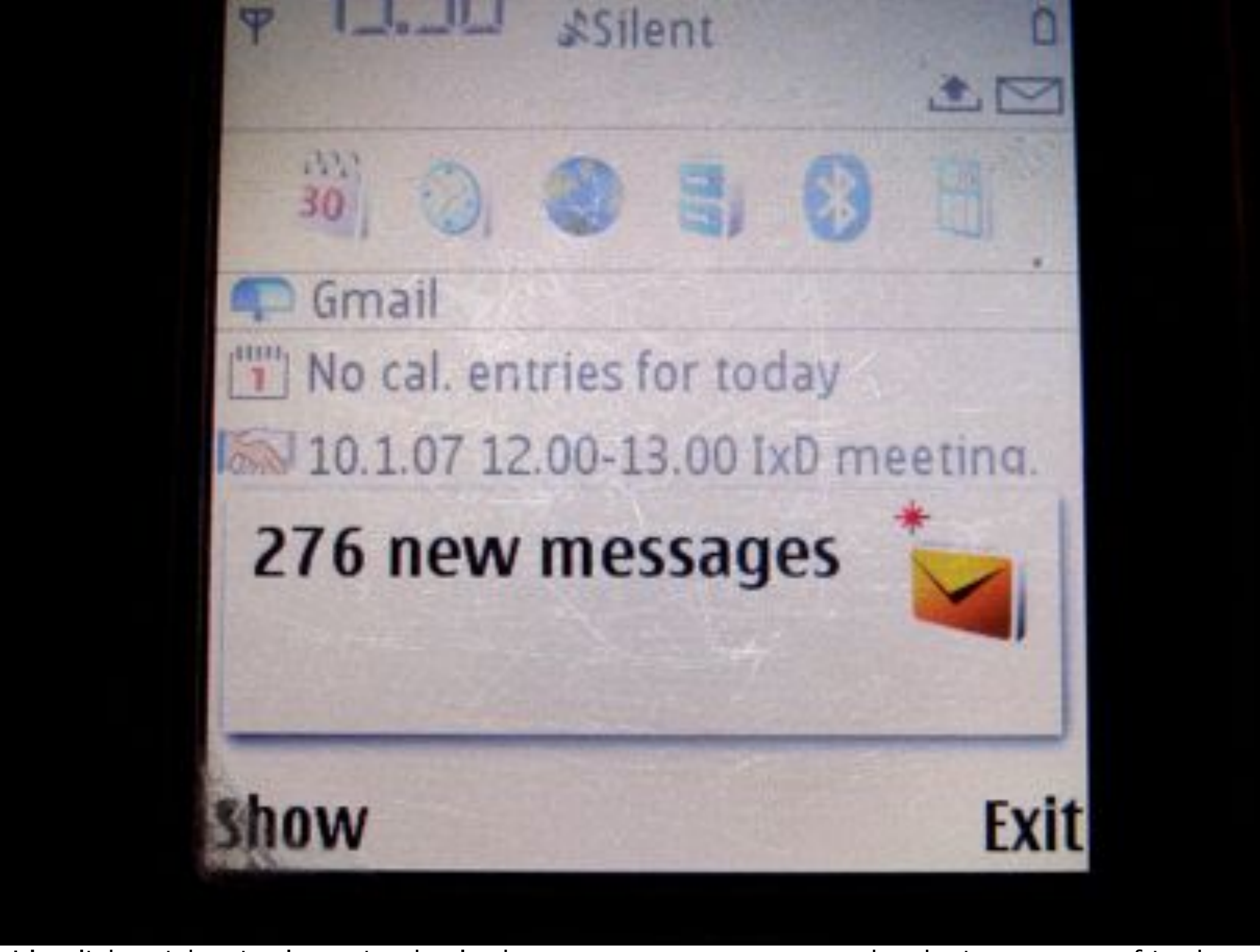
The most interesting part was the analysis of the ways in which time changes with progressive, lightweight communications.

This is an area that has been studied extensively by Rich Ling.

Eating almonds.

06:38 AM November 30, 2006 from web

Twitter is a new social software service that simply asks “what are you doing?”. It shares presence activity with your friends...



It’s a lightweight, simple service that leads to spontaneous meetups and gatherings amongst friends.

But it’s also a technical accident, ending up with situations like this where the technology is totally wrong for the interaction.

There are a few projects now that deal with a sense of place.

Familiar Strangers is now quite an old project by Eric Paulos and Liz Goodman for Intel.

Uses Bluetooth to anonymously remember the people around you. It builds up an ambient picture of a city that otherwise wouldn’t be visible

Nokia wave-messaging: puts information back into space, and creates social and performative opportunities (photo thanks to Matt Webb)

At the moment there is also huge interest from advertisers and marketers in making interactive, place-based advertising, this is a bluetooth poster that offers TV ads directly to your phone.

Yellow Arrow is an early project that looked at putting digital information into places, and used the mobile phone and SMS as a platform.

Semapedia is a similar project that links encyclopaedia information to places. It uses barcodes that you can photograph with your cameraphone.

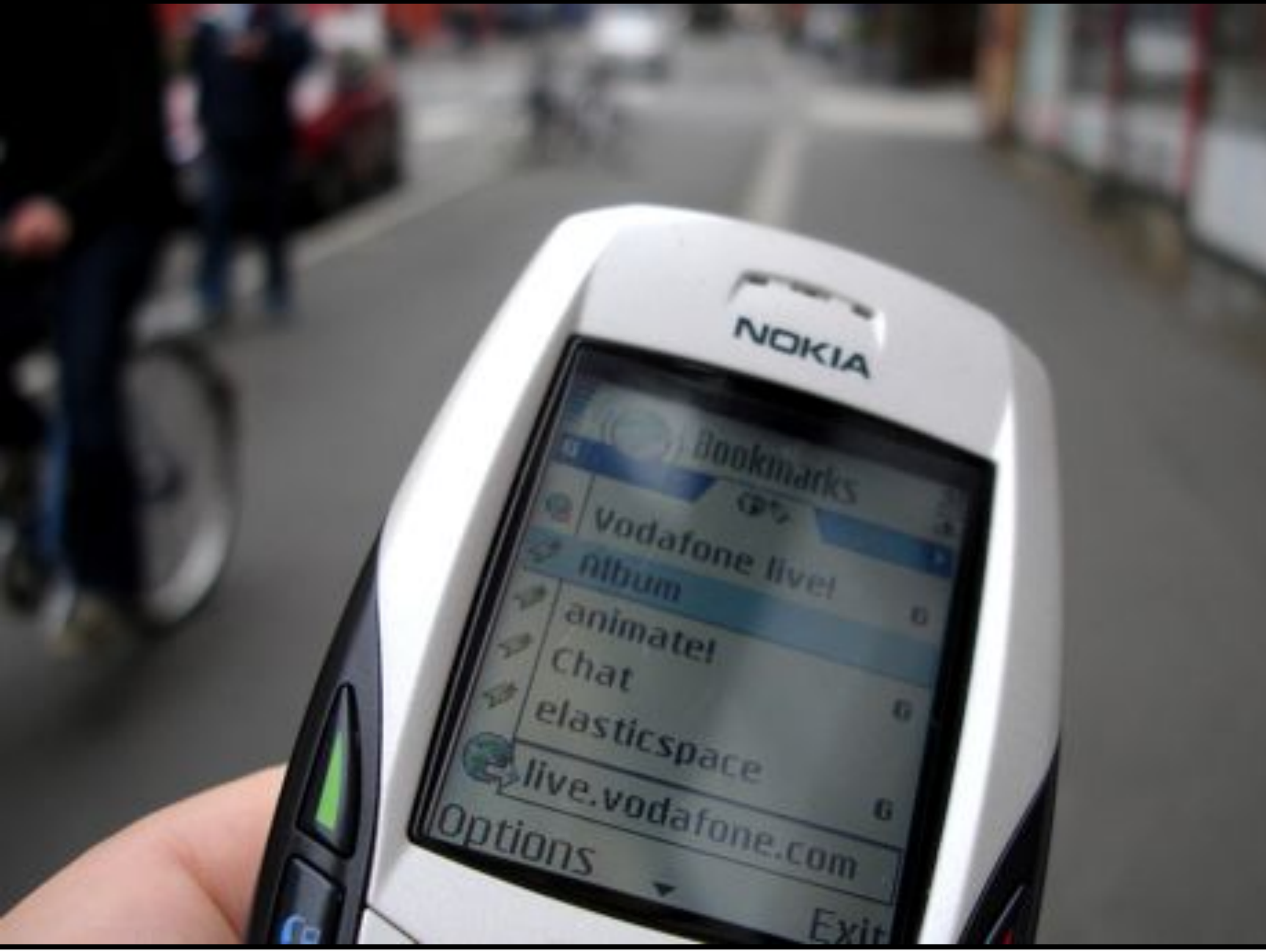
Image from NY Times

In Japan, the use of barcodes, or QR codes is widespread. Interestingly they can be used at a variety of scales, from small printed magazine adverts up to building sized banners.

So when designing things in the physical and social world leads us to the critical issues of context and situation: this is major new ground that designers need to cover.

Context and situation is one of the big unsolved technological problems. It's what computer scientists call 'context awareness' and it's an incredibly hard problem that people have been trying to solve for years. Why is it unsolved? Too complex, and too reliant on the 'intelligence of the machine'.

As an example, knowing when and where your phone should automatically go silent is a huge challenge.



And partly because of this, mobile usability is also really hard:

We’re dealing with:
Situations that can be interrupted
Two hands already used up
The movement of other people and things can be disruptive or dangerous.
Concentration is low and distracted

- Game and play interactions becoming social and tangible
- Mobile technologies affecting time, places and things
- Mobile design is largely about dealing with context and situations

So to summarise some of these patterns.

With the NDS, Wii and Eyetoy the cutting edge of interaction design is now about the social and tangible

Mobile technologies have had a particular effect on our use and experience of time. Mobile technologies are intended to start changing our experience of places and things.

Working with different contexts and situations is tremendously difficult. And mobile usability is a hard design issue

2. Our design work

So with some of those patterns of new software in mind, I would like to show you some of the things that we are working on.

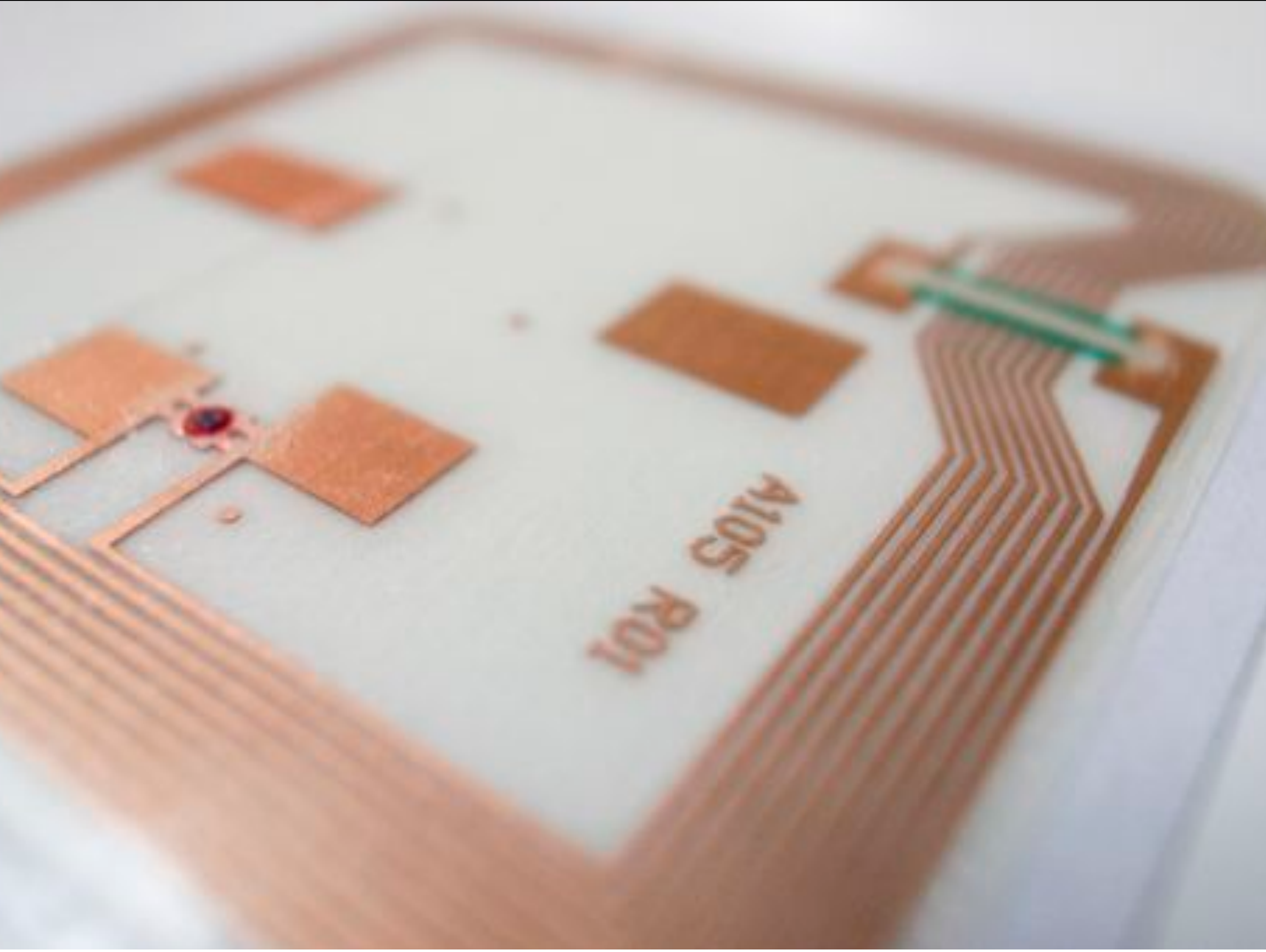
The Touch project started out in 2004. I was doing informal research into the marking of public space.

This research was particularly interested in the vernacular and bottom up ways that urban space was marked.

This led me to think about projects like Yellow Arrow and Semapedia which were emerging at the same time. They were attempting to replicate what was already going on in the city, but in a very top-down manner. I was interested in what was happening on the streets.

At a conference in 2004 I was introduced to a Nokia prototype phone that would read and write RFID chips.

This technology is called NFC, or Near Field Communication.



RFID is a very simple technology; tiny, batteryless chips that can be embedded in just about anything. They contain small amounts of information, that can be read by a mobile phone.

The industry view of this technology is that it will enable us to do all sorts of things like payments, unlocking, printing, sharing and downloading in the physical world.

This is Nokia’s vision from one of their scenario videos.

A lot of it is moving towards ‘frictionless commerce’.

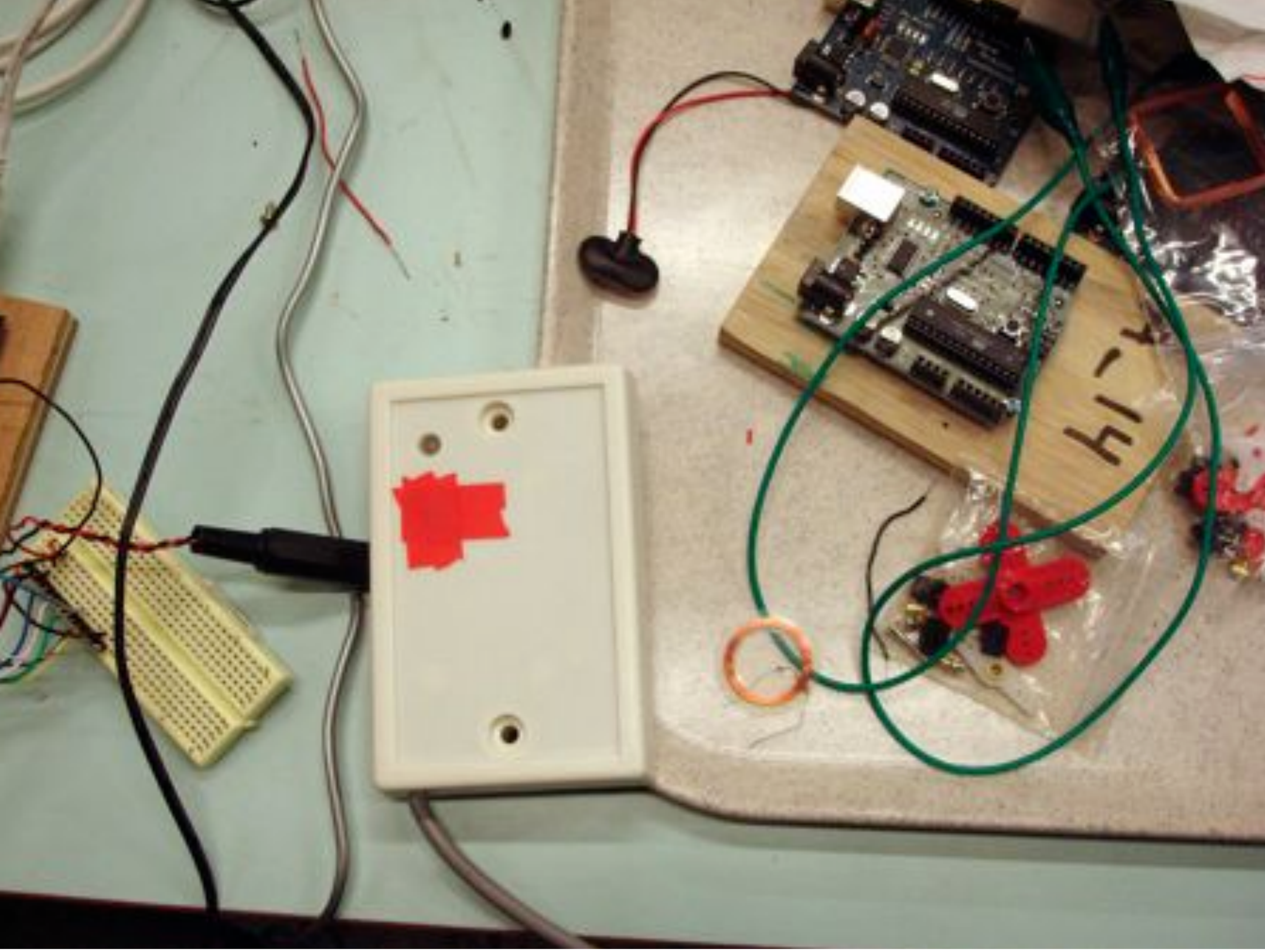
Image from Jan Chipchase

This is a poster from Tokyo showing a ‘Suica’ phone paying for a seat on a train. No ticketing or checkin required. This shows us some of the new ways in which interactions in public space can be configured.

But right now there is a lack of understanding about how these interactions work in detail, or any experimentation and design work going on in real contexts and situations.

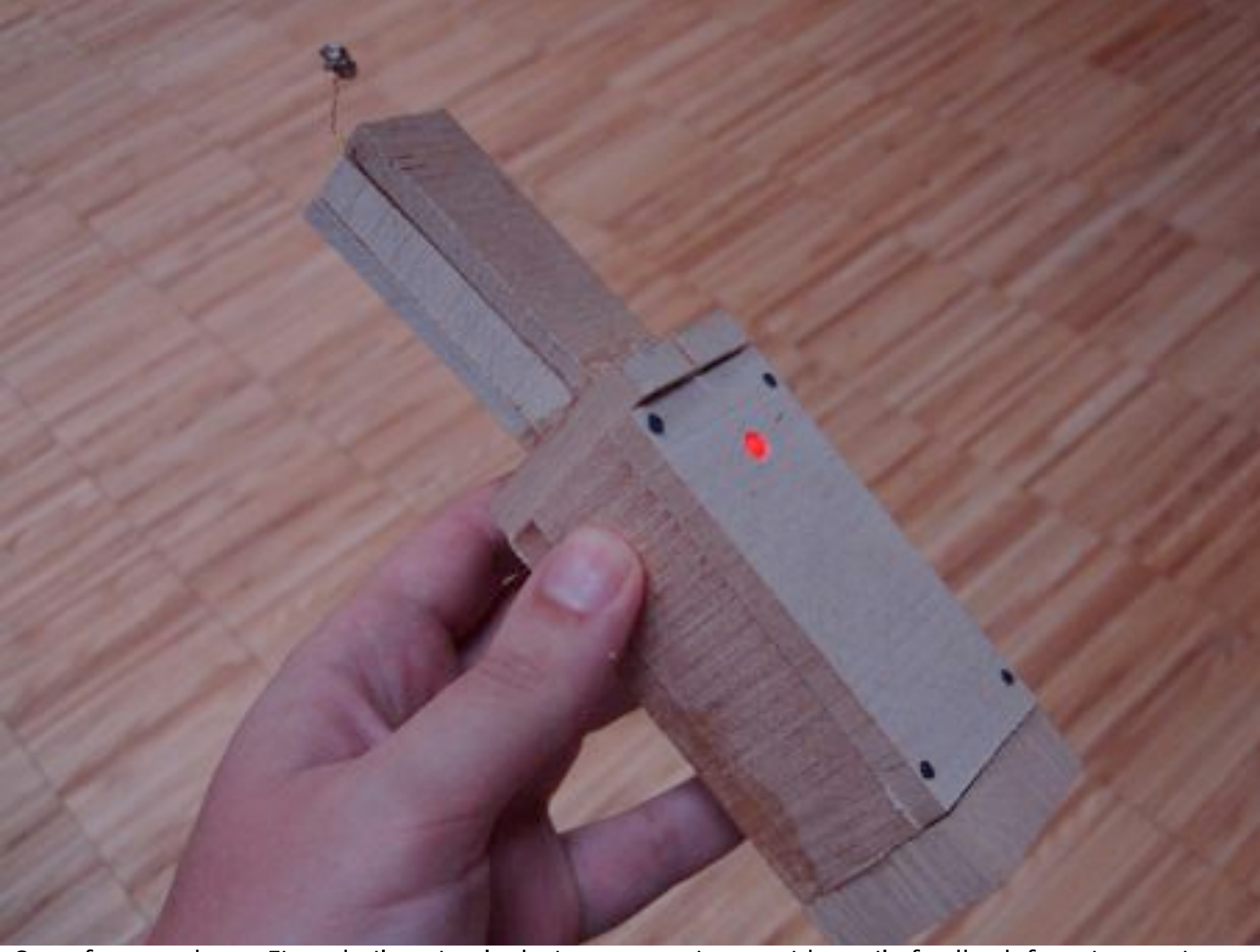
So our projects so far have been experimenting with prototyping interactions and services that we can use to think about the future.

So in order to start experimenting with the interactions, we have gone back to basics: what does putting an RFID close to a reader feel like? And it turns out, it’s not simple.



RFID turns out to be very unreliable, delicate and hackable. There are weird opportunities here.

Like the SMS protocol, RFID is incredibly simple, and it may similarly lend itself to being used in ways we cannot predict or design.



One of our students, Einar, built a simple device to experiment with tactile feedback from interacting with physical objects: the ‘wand’ vibrates whenever you touch something.

On to experiments with contexts and situations. This is something we are working on right now, and we have some early student work to show.

One of our student groups last year studied a record shop and found hundreds of interactions that happen daily around playlists, picks, staff lists, events etc. A really rich space for prototyping new applications.

Another group experimented with events and presence. Building upon the event service Underskog they built a system that gets people to tell others that they are present.

Another group looked at ways that artwork could be shared and ‘gifted’ by touching gallery artworks.

We built a desk that allowed you to phone or text message people by placing the phone on a postit note.

It was interesting in the ways in which it failed: it didn't make sense to locate phone numbers in a particular place. But it did make sense to make the corner of the table an SMS message saying 'I'm home'.

We also experimented with ‘toys with identity’: a table where characters can trigger emotions by placing them on different spots.

The physical characters match those on screen, and provide a direct way of manipulating media.

The table uses RFID technology and lets us think about how we can use objects that have behaviours beyond their physical form...

During our demonstrations we had about 800 people testing it out, and kids piled five deep to reach the characters.

Although this is not based on the mobile phone, it has shown us patterns of use that allow us to move forward and design new phone-based interactions.

In particular it allows us to see that people are generally very adept at relating physical objects to digital content.

www.nearfield.org

This is all work in progress.

I can encourage you to keep up with what we are doing at the project weblog, and keep in touch if you'd like to know more.