Gesture Connect

Trevor Pering

Yaw Anokwa

Roy Want

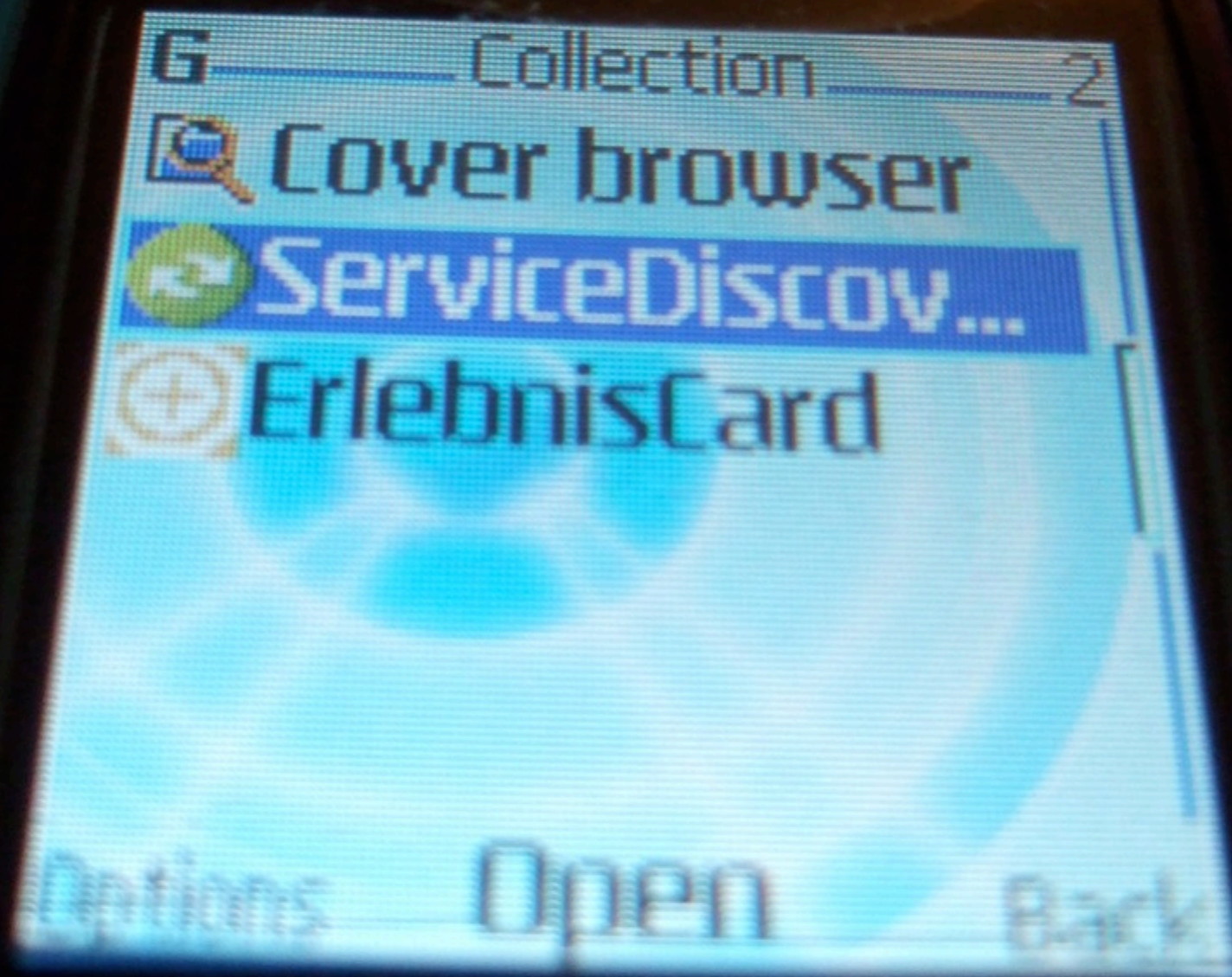Lots of people out
there

Lots of people have phones

NFC/RFID is emerging tech for tangible interaction – mostly for payment

Starting to crop up in all sorts of places

NFC extends RFID to provide a mechanism for two-way data transfer

However – the interaction is still very limited, and dominated by interaction through the small display of the phone

So – consider the scenario where trusty Yaw is returning home, and he has been watching a video on his phone

He sits down, but it's kinda painful to watch the video on his small device

So, he turns on the TV to see what is
playing

He really likes it, so he makes a simple gesture to capture the program so he can view it later

Now he can easily check the details of the program, saved for later viewing
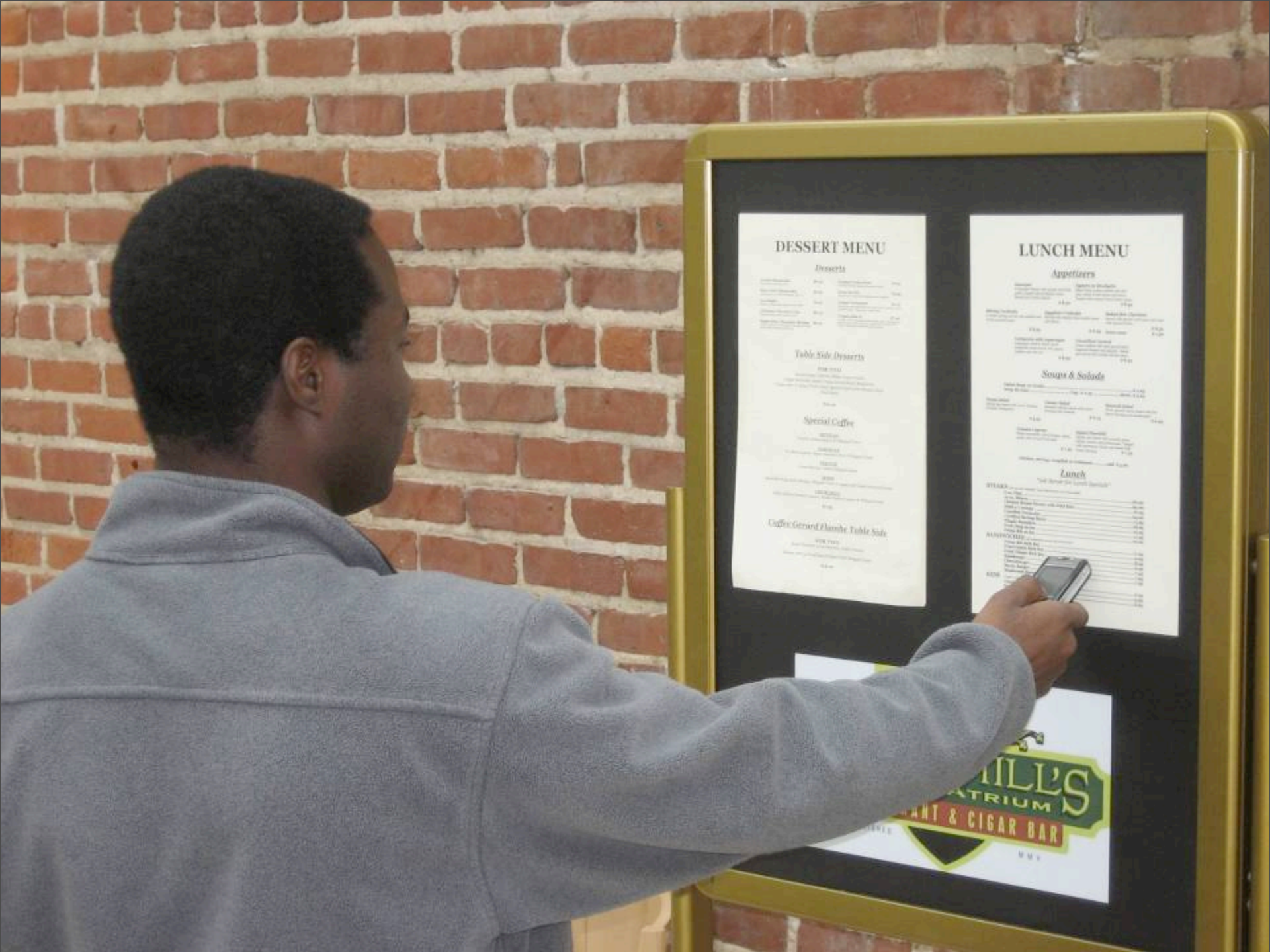
So, now he can happily finish watching his program…

Or to capture the location and/or menu for later return, if he doesn't find anything better

Also can be used to easily push his room temperature settings to the thermostat

Alternately, he can use the on-screen interface to do a Bluetooth scan or something similar to discover the TV and push his content – not very convenient.
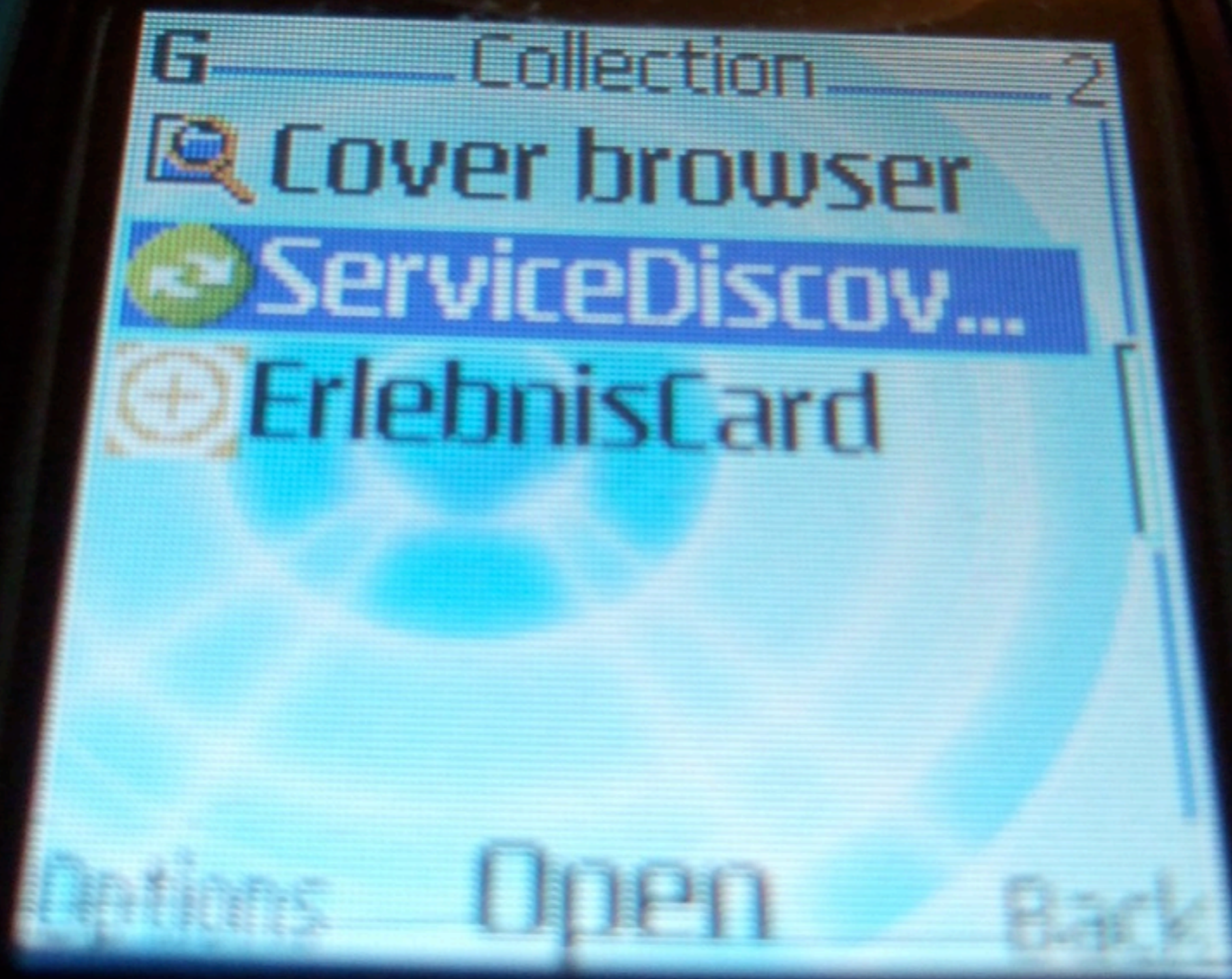
However – the interaction is still very limited, and dominated by interaction through the small display of the phone

So, what we wanted to do was extend the capability of the
phone

Using a standard SD-card
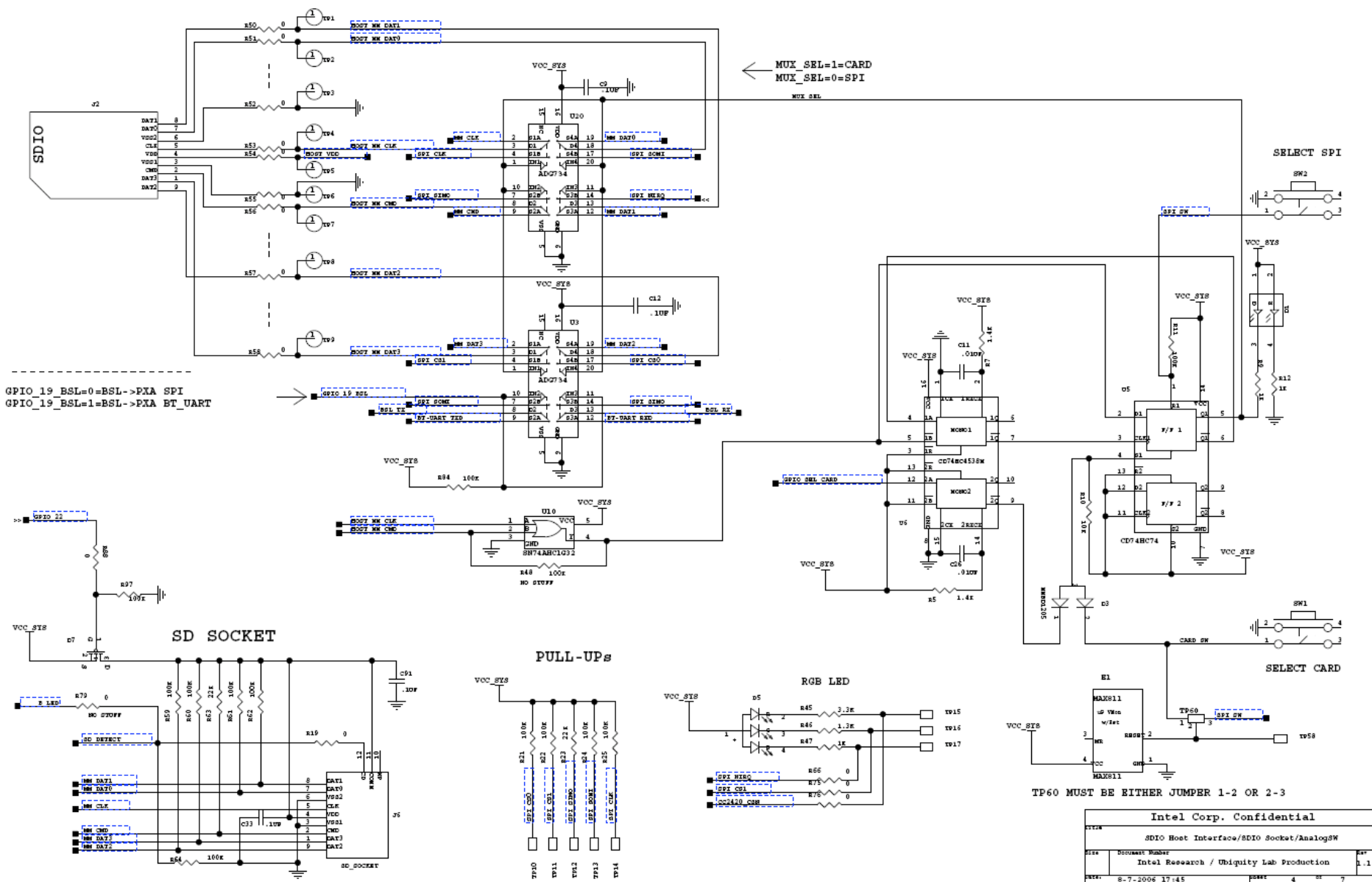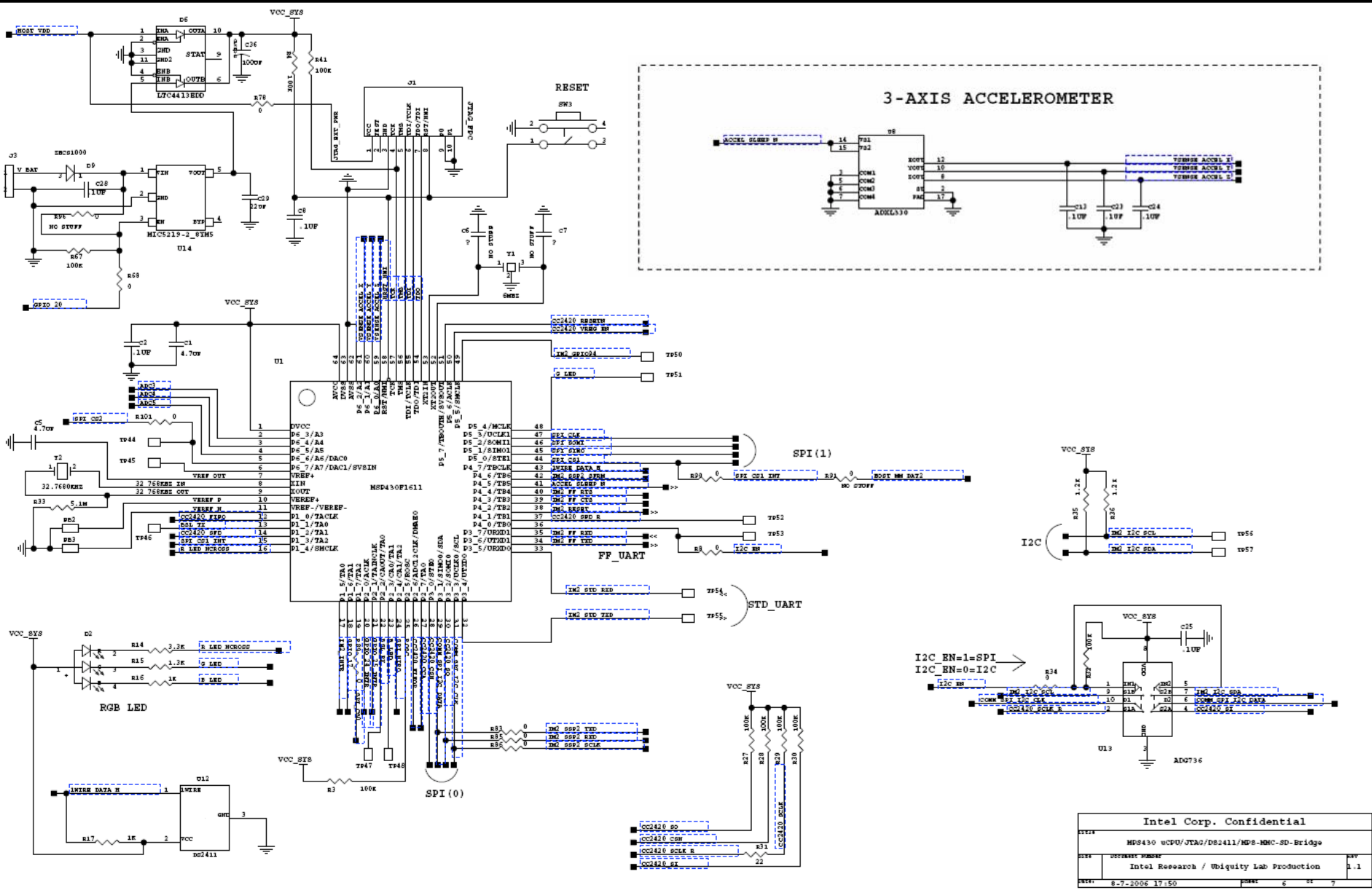interface

To form a prototype system allowing people to explore emerging interaction techniques with such devices
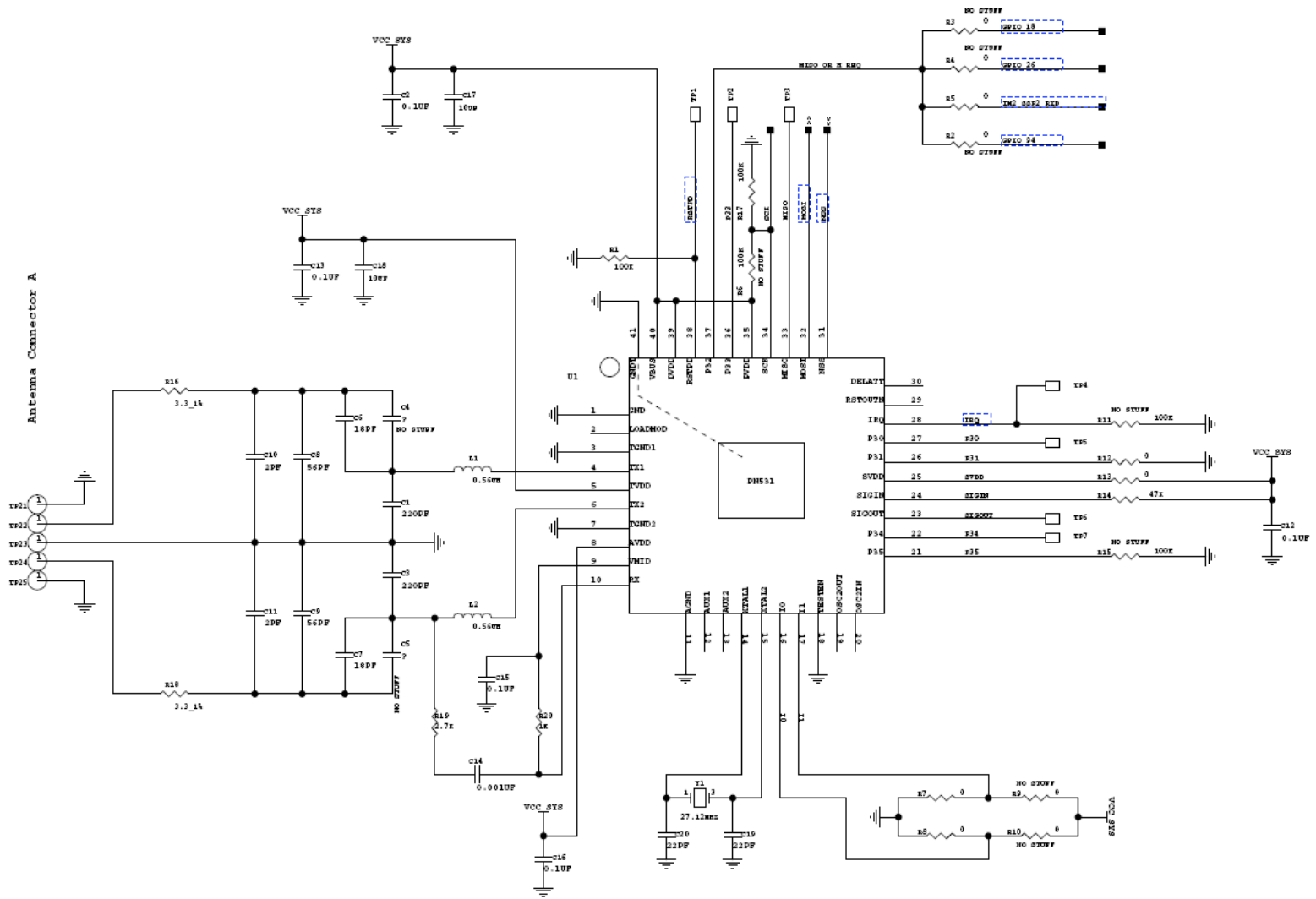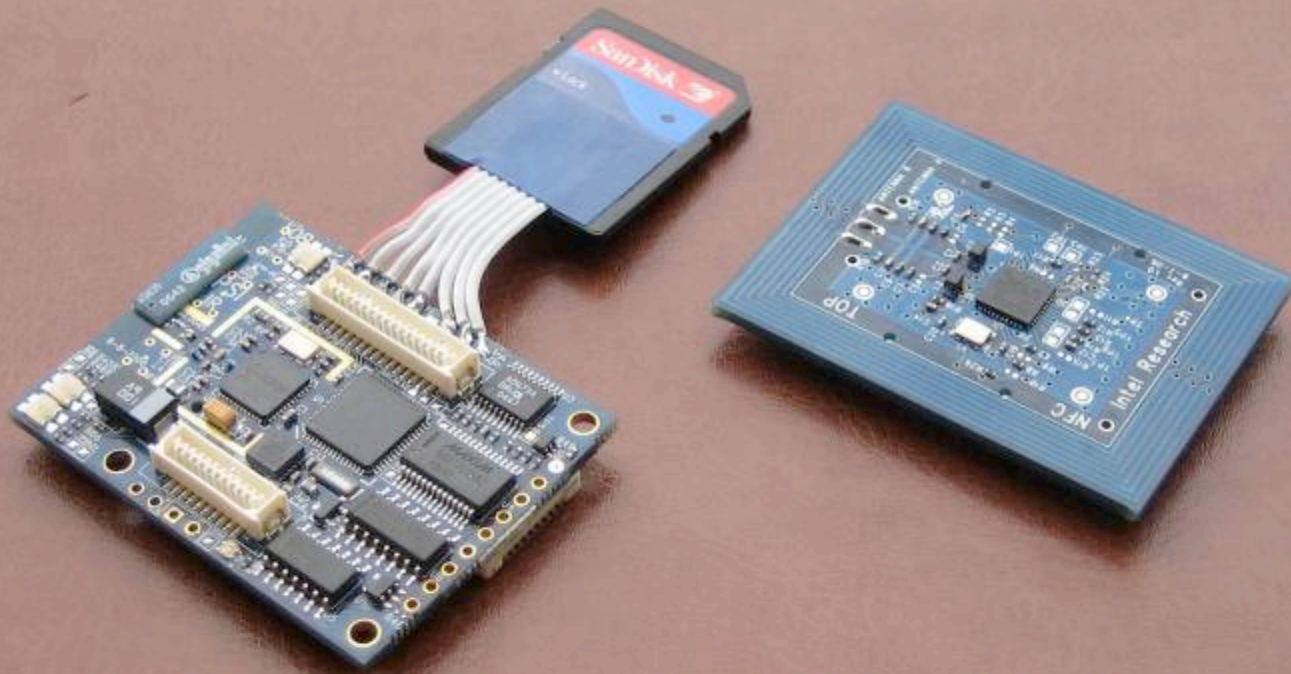
Whizzy schematics to impress
people

3-AXIS ACCELEROMETER

Very very
quickly

Intel Corp. Confidential

MDS430 uCPU/JTAG/DS2411/MP3-MMC-SD-Bridge

Intel Research / Ubiquity Lab Production

8-7-2006 17:50

Antenna Connector A

VCC_SYS

C2
0.1UF

C17
100N

MISO OR N REQ

NO STUFF
R3   0   GPIO 19
NO STUFF
R4   0   GPIO 26
R5   0   TM2 SSP2 RXD
R2   0   GPIO 34
NO STUFF

VCC_SYS

C13   C18
0.1UF 100F

TP1 TP2 TP3

R33 R17
100K 100K
SCK
MISO
MOSI
RXD

R1
100K

R6 100K
NO STUFF

U1

PN531

41 GND
40 VBUS
39 DVDD
38 RSTPD
37 P32
36 P33
35 DVDD
34 SCK
33 MISC
32 MOSI
31 NSE

1   GND
2   LOADMOD
3   TVDD1
4   TX1
5   TVDD
6   TX2
7   TVDD2
8   AVDD
9   VMID
10 RX

L1
0.56UH

L2
0.56UH

30 DELAYT
29 RSTOUTN
28 IRQ
27 P30
26 P31
25 SVDD
24 SIGIN
23 SIGOUT
22 P34
21 P35

TP4
IRQ
R11 100K   NO STUFF
P30   TP5
P31   R12 0
SVDD   R13 0
SIGIN R14 47K
SIGOUT TP6
P34   TP7
P35   R15 100K   NO STUFF

VCC_SYS

C12
0.1UF

R16
3.3_1%

C6
18PF

C4
NO STUFF

C10   C8
2PF   56PF

C1
220PF

C3
220PF

C11   C9
2PF   56PF

C7
18PF

C5
NO STUFF

R18
3.3_1%

R19
4.7K

R20
1K

C15
0.1UF

C14
0.001UF

VCC_SYS

C16
0.1UF

TP21
TP22
TP23
TP24
TP25

11 AGND
12 AUX1
13 AUX2
14 XTAL1
15 XTAL2
16 IO
17 TESTEN
18 OSC2OUT
19 OSCIN

T1
27.12MHZ

C20   C19
22PF 22PF

R7 0   NO STUFF
R9 0
R8 0   R10 0   NO STUFF

VCC_SYS

Combined with custom hardware to add NFC + Accel capability

The same basic technique can be applied to different phones, providing they provide the standard SD-card interface

CSLL

CompositionManage
rjar

code

Terminal

File Edit View Terminal Tabs Help

File Edit Options Buffers Tools C Help

```
                  tprintf(", ");
                  addr = tcp->u_arg[1];
        } else {
                  addr = tcp->u_arg[2];
        }
        if (addr == 0)
                  tprintf("NULL");
        else if (!verbose(tcp))
                  tprintf("%#lx", addr);
        else if (umove(tcp, addr, &sv) < 0)
                  tprintf("{...}");
        else {
                  switch ((int) sv.sv_handler) {
                  case (int) SIG_ERR:
                            tprintf("{SIG_ERR}");
                            break;
                  case (int) SIG_DFL:
                            tprintf("{SIG_DFL}");
                            break;
                  case (int) SIG_IGN:
                            if (tcp->u_arg[0] == SIGTRAP) {
                                      tcp->flags |= TCB_SIGTRAPPED;
                                      kill(tcp->pid, SIGSTOP);
                            }
                            tprintf("{SIG_IGN}");
                            break;
                  case (int) SIG_HOLD:
                            if (tcp->u_arg[0] == SIGTRAP) {
                                      tcp->flags |= TCB_SIGTRAPPED;
                                      kill(tcp->pid, SIGSTOP);
                            }
                            tprintf("SIG_HOLD");
                            break;
                  default:
                            if (tcp->u_arg[0] == SIGTRAP) {
                                      tcp->flags |= TCB_SIGTRAPPED;
                                      kill(tcp->pid, SIGSTOP);
                            }
                            tprintf("{%#lx, ", (unsigned long) sv.sv_handler);
                            printsigmask(&sv.sv_mask, 0);
                            tprintf(", ");
                            if (!printflags(sigvec_flags, sv.sv_flags))
                                      tprintf("0");
                            tprintf("}");
                  }
          }
}
```

-u-:---F1 signal.c   (C CVS-1.1.1.1 Abbrev)--L484--29%--------------------

Terminal

```
er
...

0 0
w,data=ordered 0 0


volatile tmpfs rw 0 0


/media/code smbfs rw,nodiratime,nosuid,nodev,u
e=0755 0 0
```

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@#
                                          @#
*  WARNING  **  WARNING  **  WARNING  **  @#
                                          @#
RUNNING X11VNC WITHOUT A PASSWORD!!       @#
                                          @#
ne with network access to this computer   @#
 easily view and control your desktop.    @#
                                          @#
not mean to do this Press CTRL-C now!!  <<< @#
                                          @#
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@#

            x11vnc
ll %1

            x11vnc
```

Terminal | Terminal | Terminal

Which is fairly common (but not ubiquitous) for multimedia capable devices.
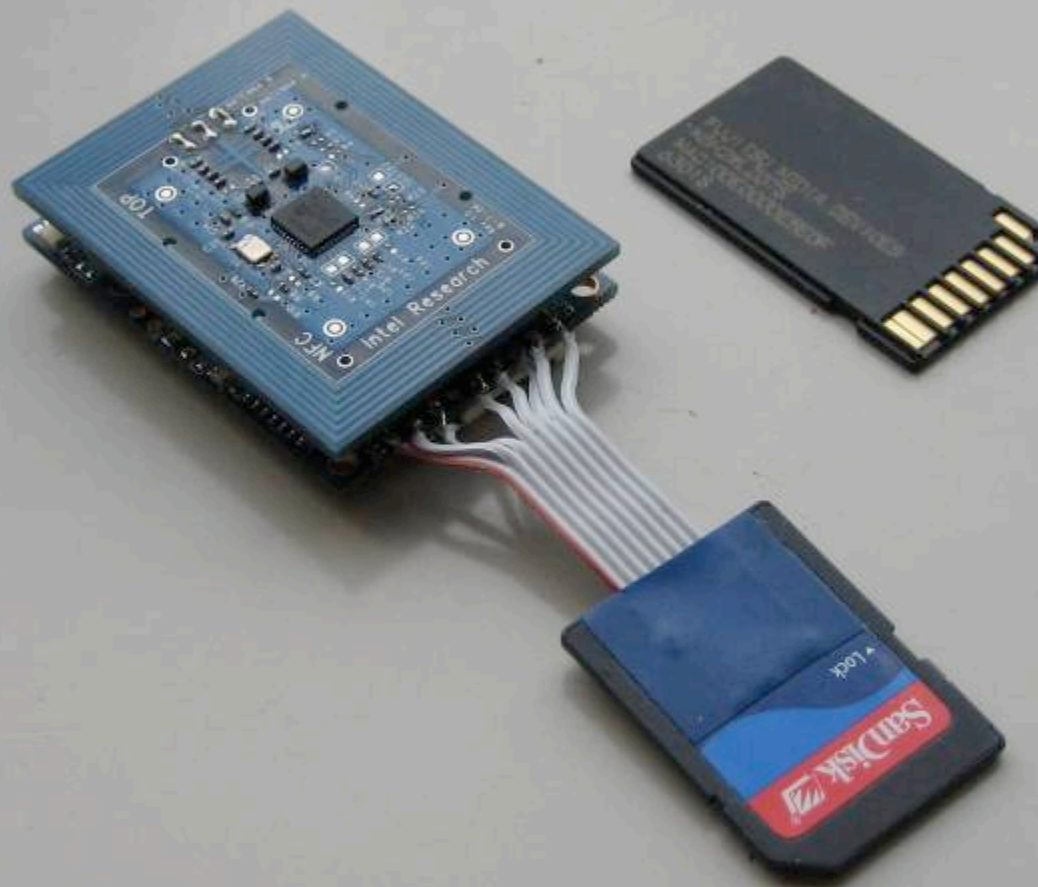
So, he turns on the TV to see what is playing

He really likes it, so he makes a simple gesture to capture the program so he can view it later

Combined with custom hardware to add NFC + Accel capability

Ideally, this design could be shrunk down to the size of a standard card (actual Wifi SD card shown for comparison), and eventually integrated into the phone

NFC extends RFID to provide a mechanism for two-way data transfer

Point of the project is to explore phone-centric novel tangible interaction techniques that can eventually be easily pushed to the mass market. The iphone – BTW – has an accelerometer in it… but no NFC…

To these
people

However – the interaction is still very limited, and dominated by interaction through the small display of the phone
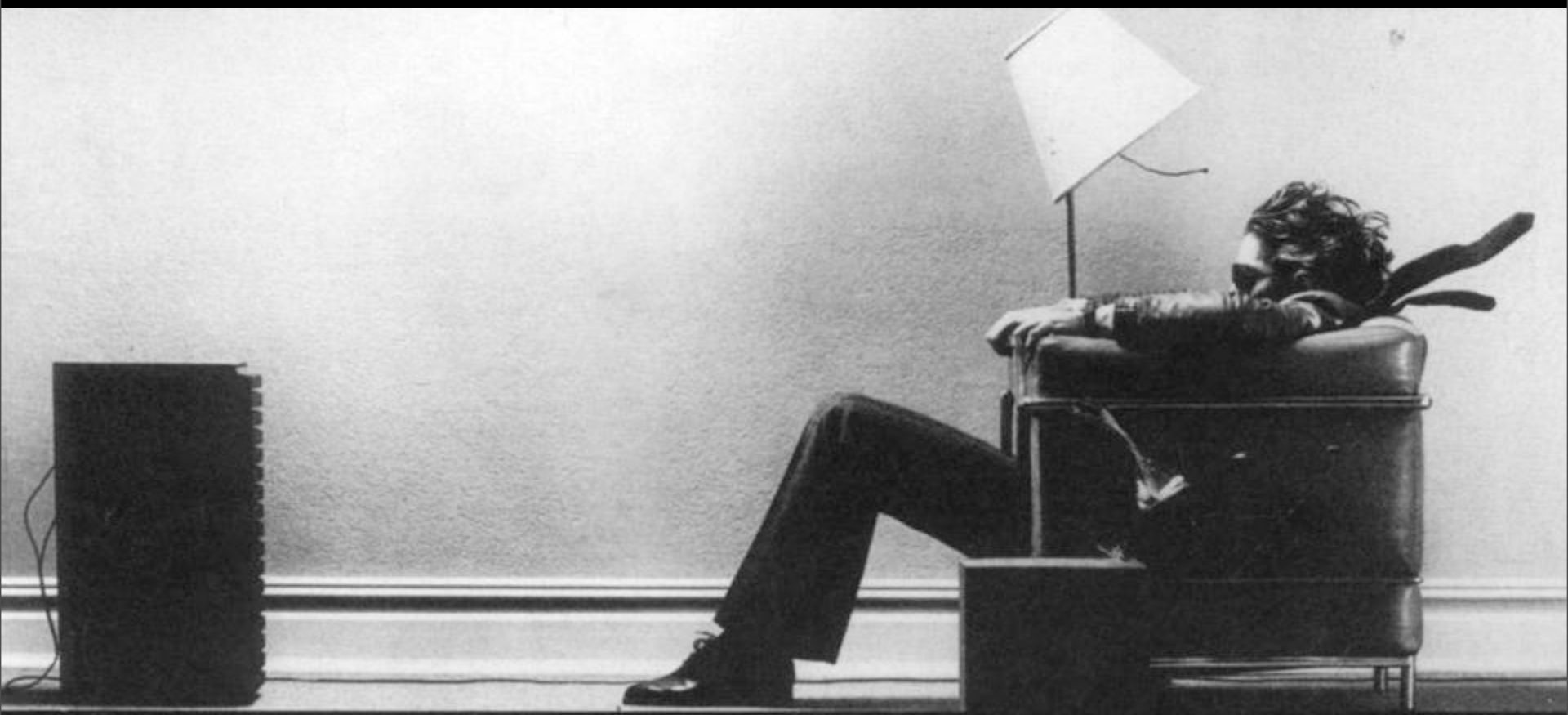
Which is fairly common (but not ubiquitous) for multimedia capable devices.

Conclusions/Summary

Extend phones with NFC + Gestures

Use simple gestures for simple commands

Towards wide-spread use of streamlined tangible interaction

Which is fairly common (but not ubiquitous) for multimedia capable devices.