

Programming with a gamepad

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Overview

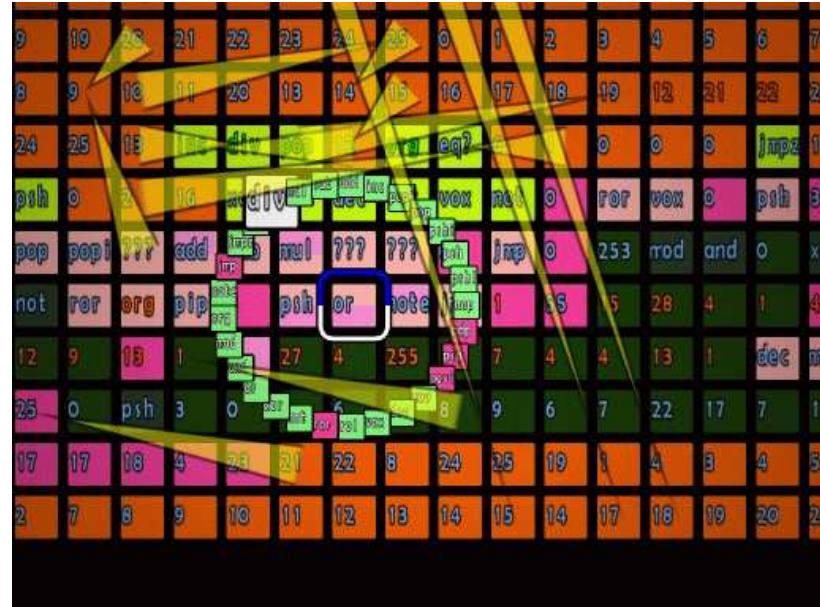
- 2 music live coding environments
- Common stuff they share
 - Gamepads
 - Ringmenus
 - Uncrashable languages
- Betablocker
 - Demo
- Al-Jazari
 - Demo
- Thoughts



Common stuff

Vague themes

- Make watching live coding a bit more accessible
- Live coding doesn't have to be about text editors
- Live coding doesn't have to be hard



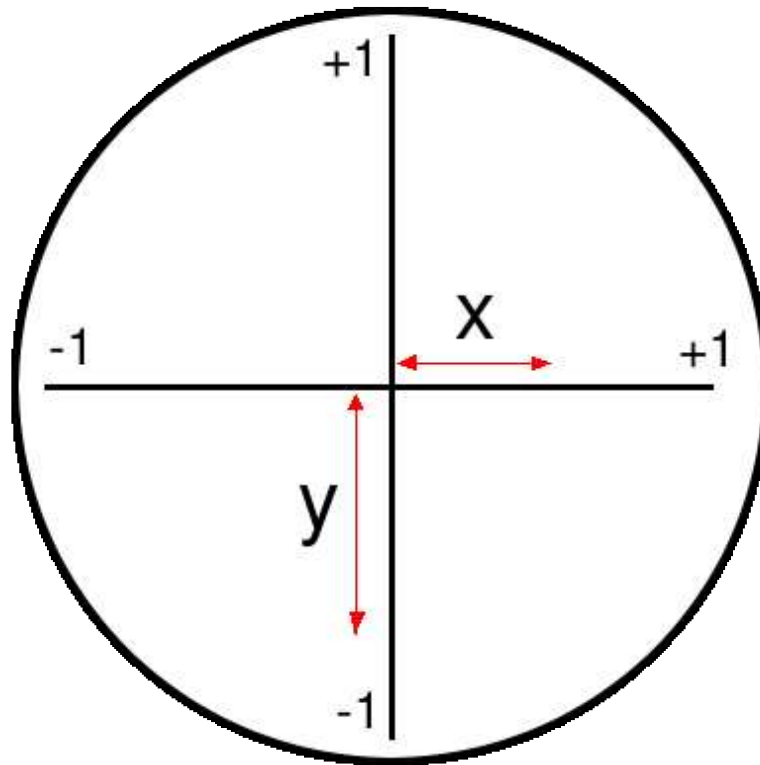
Gamepads

- Analogue sticks
- Directional pad
- Right hand buttons
- Shoulder buttons
- Force feedback
- Analogue buttons



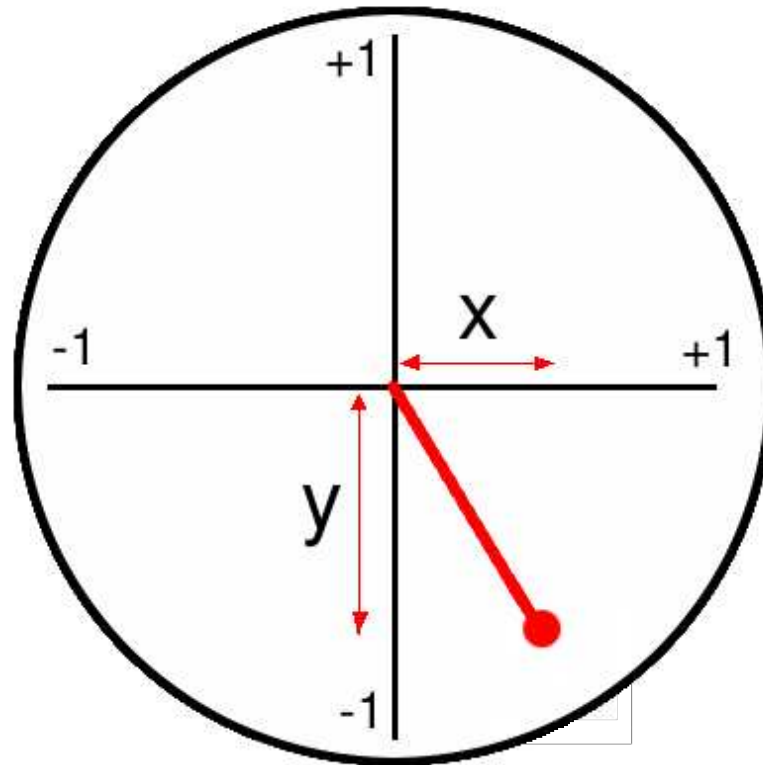
Ring Menu

Ring menu



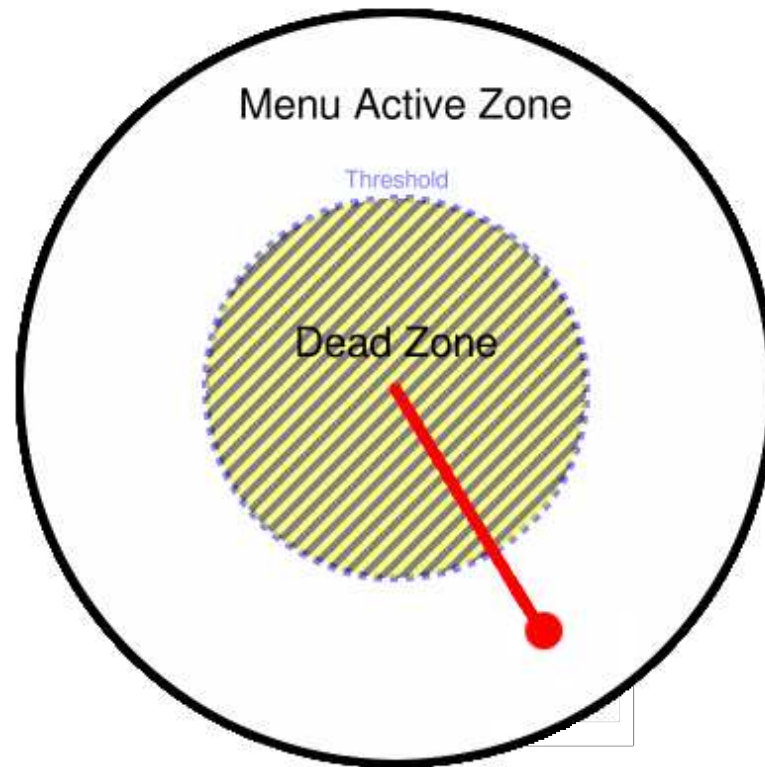
Values from analogue stick

Ring menus



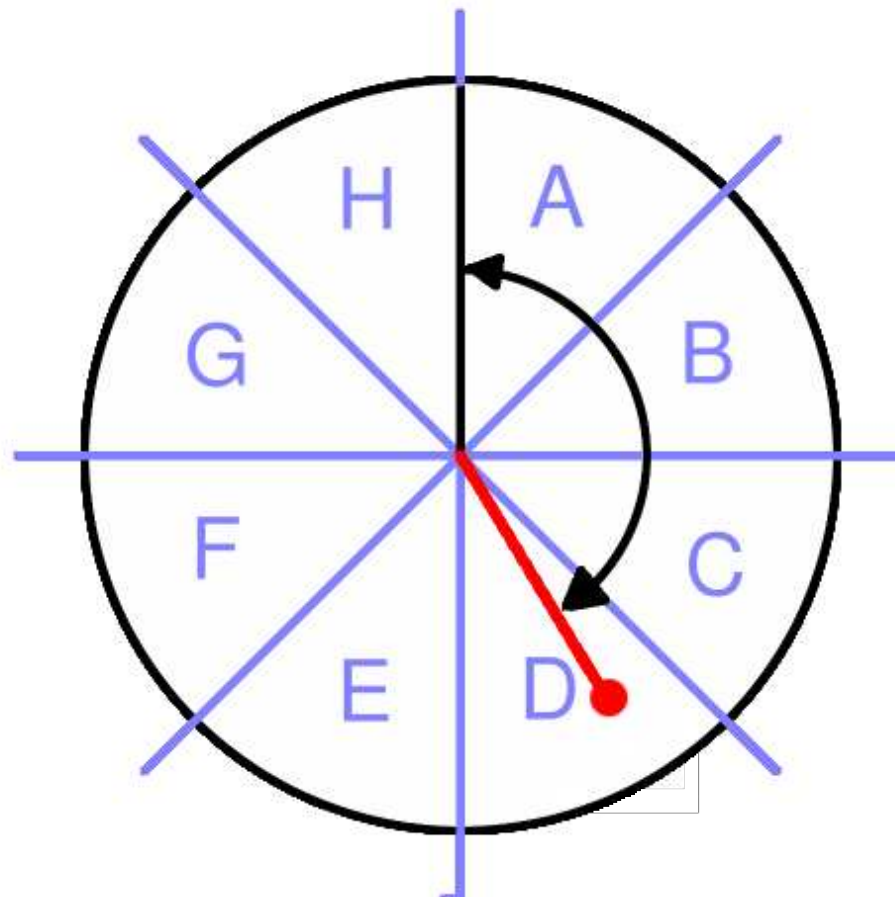
Convert to vector

Ring menu



Use magnitude to activate menu

Ring menus



Use angle to pick from items

Ring menus

- Nice tactile feel
- Good use of muscle memory
- You can pick from quite a large range
- Seems easier than mouse based 'gestures'



Uncrashable Languages

Uncrashable Languages

- Design away crashes
 - Divide by 0 returns 0
 - Invalid memory read returns 0
- Genetic programming: Tierra
- Not good for general purposes
 - Crashes stop unintended code from executing
 - Removing them makes bugs very hard to find

```
*** STOP: 0x00000019 (0x00000000,0xC00E0FF0,0xFFFFEFD4,0xC0000000)
BAD_POOL_HEADER

CPUID: GenuineIntel 5.2.c irq:1:1f SYSVER 0xf0000565

Dll Base DateStmp - Name Dll Base DateStmp - Name
80100000 3202c07e - ntoskrnl.exe 80010000 31ee6c52 - hal.dll
80001000 31ed06b4 - atapi.sys 80006000 31ec6c74 - SCSIPORT
802c6000 31ed06bf - aic78xx.sys 802cd000 31ed237c - Disk.sys
802d1000 31ec6c7a - CLASS2.SYS 8037c000 31eed0a7 - Ntfs.sys
fc698000 31ec6c7d - Floppy.SYS fc6a8000 31ec6ca1 - Cdrom.SYS
fc90a000 31ec6df7 - Fs_Rec.SYS fc9c9000 31ec6c99 - Null.SYS
fc864000 31ed868b - KSecDD.SYS fc9ca000 31ec6c78 - Beep.SYS
fc6d8000 31ec6c90 - i8042prt.sys fc86c000 31ec6c97 - mouclass
fc874000 31ec6c94 - kbdclass.sys fc6f0000 31f50722 - VIDEOPO
fcffa000 31ec6c62 - mga_mil.sys fc890000 31ec6c6d - vga.sys
fc708000 31ec6ccb - Msfs.SYS fc4b0000 31ec6cc7 - Npfs.SYS
fefbc000 31eed262 - NDIS.SYS a0000000 31f954f7 - win32k.s
fefa4000 31f91a51 - mga.dll fec31000 31eedd07 - Fastfat.
feb8c000 31ec6e6c - TDI.SYS feaf0000 31ed0754 - nbfs.sys
feacf000 31f130a7 - tcpip.sys feab3000 31f50a65 - netbt.sys
fc550000 31601a30 - el59x.sys fc560000 31f8f864 -afd.sys
fc718000 31ec6e7a - netbios.sys fc858000 31ec6c9b - Parport.
fc870000 31ec6c9b - Parallel.SYS fc954000 31ec6c9d - ParUdm.S
fc5b0000 31ec6cb1 - Serial.SYS fea4c000 31f5003b - rdp.sys
fea3b000 31f7a1ba - mup.sys fe9da000 32031abe - srv.sys

Address dword dump Build [1381] - Name
fec32d84 80143e00 80143e00 80144000 ffdff000 00070b02 - KS
801471c8 80144000 80144000 ffdff000 c03000b0 00000001 - nt
801471dc 80122000 f0003fe0 f030eee0 e133c4b4 e133c4d0 - nt
80147304 803023f0 00000023c 000000034 00000000 00000000 - nt

Restart and set the recovery options in the system control panel
or the /CRASHDEBUG system start option.
```

Uncrashable Livecoding

- Good for live coding:
 - Less chance of embarrassment!
 - Things can run out of control
 - Changes how you program
 - Malleable/brittle
- All possible programs are executable



Betablocker

Betablocker influences

- TOPLAP discussion on virtual machines ("Hello (& Chaos)" 2004)
- Corewars (Redcode)
- Forth
- Mr Driller



Betablocker

- First attempt at gamepad coding
- Virtual machine
- Multithreaded
- No memory protection
- All memory is visible
- The rhythm is a direct result of the instruction count
- Very unpredictable



Demo

Al-Jazari

Al-Jazari

- 13th century scientist and inventor
 - First recorded use of gears
 - Crankshaft
 - Mechanical clock
 - Combination lock
- Programmable humanoid robot
 - Robot musicians for royal drinking parties



Al-Jazari

(live coding for royal drinking parties)

Al-Jazari influences

- Influences
 - The Sims
 - Gullibloon's Army of Darkness
 - Simon Yuill's Spring Alpha (live coding game)
- Musical robot livecoding
- Code in 'thought bubbles'
- Indirect musical triggers
- No text



Demo

Thoughts

- Simple languages
 - No abstraction, so hard/impossible to build layers
 - Fun to play with
 - More practice will influence the languages
- Using a gamepad
 - More restricted than a keyboard
 - People don't think you are programming
 - People want to have a go
 - Detaches you from the laptop

