touching technology

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I work in Lancaster
and live in Cumbria
The Lake District
… but

although I live in England
and I speak English
I am not English
I am **Welsh**
rydw i’n Cymraeg

… and have sabbatical year so

mostly in Tiree
… when not elsewhere
today I am not talking about …

- intelligent internet interfaces
  fuzzy personal ontologies and structure from folksonomies
- situated displays, eCampus, small device – large display interactions
- visualisation and DB interfaces
- fun and games, virtual crackers, artistic performance, slow time
- modelling dreams and regret!!

… or even lots of lights

http://www.hcibook.com/alan/projects/firefly/
cognition connects with computation

when bodies touch technology

the physical world

material artefacts and design

the body

physiology

digital artefacts

virtual physicality

space and spatial arrangement

Athens/Tripolis March 2009
different ways to touch

ubiquitous comp. — tech. entering the world
tangible UI — embodying computation
... plus mobile ... — when location matters

virtual reality — emulating the world
AR / MR — blending physical and digital worlds
physiological comp. — the body is the interface
product design — physical devices with digital effect

three rules to be broken

• directness of effort
• locality of effect
• visibility of state
continuity
in time and space
physicality and the body

bodily limitations – skin and bone

- ergonomics and health
  - keyboards and trackpads
  - car switches

- as a design resource
  - simultaneous switches in nuclear bunker
  - sweeties on the high shelf
bodily limitations – grey matter

• fleeting thoughts – electrical
  – Millers 7 +/- 2

• long-term memory – physical connections
  – some sums ...

• mood and medium term memory – chemical
  – coping with multiple chat windows

action in the world

• Gibson and affordances

• distributed cognition

• the embodied mind
physicality and design
levels of fidelity in design

from paper prototype to working mock-up

study the old to design the new

• look at ordinary consumer devices
  – washing machine, light switch, personal stereo

• why?
  – we are used to using them ourselves
  – they have been ‘tested’ by the marketplace
  – they embody the experience of designers
half empty?

• not the first …
  – Norman – DOET/POET
  – Thimbleby – FSM for video, microwave

• often used as HCI strawman
  – emphasise for design flaws

• we are looking for the good lessons
  – how mundane devices exploit physicality

models of AR & tangibility

• Ullmer and Ishii – MCRpd
  – architectural interaction model

• Benford et al. – sensible/sensable/desirable
  – exploring design space

• Koleva et al. – TUI framework
  – ‘coherence’ between the physical and digital
multiple feedback loops

the GUI fallacy … semantic feedback is NOT enough

model physical device states
the device ‘unplugged’

• the device ‘unplugged’
model logical system

two states of the system

physical–logical mapping

user pushes switch up and down
exposed state

mapping 1-1

switch

light

user pushes switch up and down

particularly easy to understand and use
but not always 1–1

controlled state

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compliant interaction

(1) system state visible through control
(2) system and user have similar effects

give it to designer
• ‘real’ world and ‘virtual world’ interactions are all physical
  ... but some are more physical than others

• understanding physicality is fascinating
  ... and helps us to design better

• watch for the book ... TouchIT