Poking Fun at the Surface:
Exploring Touch-Point Overloading on the Multi-touch Tabletop with Child Users

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Some Context

- Desktop Interfaces
  - Constrained
    - Usually one person, one screen, one mouse
  - Well understood

- Natural User Interfaces
  - Focus on the technology
  - Focus on the exciting applications
  - The underlying understanding lags behind...

Multi-touch Tabletops

- Collaborative
- Different Interaction methods
- Still exploring new interaction possibilities
- Still exploring new application possibilities

- We know little about users in this context
  - Preferences, Constraints, Collaboration, Models, etc

This paper

- Designing a game (for children) on the surface

  - How should they interact?
  - How many touch points can they deal with?
  - How will they organise themselves (logically, physically)?
  - Can they work together meaningfully?

  - I could play-test, but I want a deeper understanding

Touch Overloading

- Aims
  - How many simultaneous touch points can be supported?
  - How do children work together to succeed?

- Developed Surface Pipes
  - Pipes spring leaks of different sizes, children work together to 'save' as much water as they can
  - Number of leaks grow with time, leaks persist, locations are random.

The Study

- School classes on a Mess Day
  - 19x 8-9 (year 3), 23x 10-11 (year 5)

- Groups of 5-7 children
  - Small groups then whole group play together.

- All interactions logged
  - Score – amount of 'water' lost
  - Accuracy - % touches on target

- Sessions observed and videoed

Surface Pipes
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Results
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- 23 is the magic number
  - After this accuracy is tailing off
- Max touch points 27–42 (7 per user!)
- Accuracy between 51-78%
  - % of touches on target
- Girl groups 10-11 scored highest
  - ~6,000 (mean ~12,000
- Boy group 8-9 scored lowest
  - ~18,000

Findings
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- Successful collaboration was very apparent but happened rarely
- Microsoft Surface not designed for little fingers
- Spreading of fingers was problematic
- Also problems with occlusion, coordination/ competition, communication

Questions?
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- Thanks for listening!
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