COMS W4172
Case Study: 3D Windows/Desktops 2

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www.cs.columbia.edu/graphics/courses/csw4172

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BumpTop  A. Agarawala and R. Balakrishnan
www.bumptop.com

- Originally research project (2006), later product, then acquired by Google (2010)
- Piles
- Selective use of physics
- Pen-based interaction
**BumpTop**  A. Agarawala and R. Balakrishnan  
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- Piles
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- Pen-based interaction

http://www.youtube.com/watch?v=M0ODskdEPnQ

**SpaceTop**  J. Lee, A. Olwal, H. Ishii, C. Boulanger, CHI 2013

- Transparent OLED display
- Depth cameras track head and hands
- Main window appears in front
- When user raises hands from kbd, main window slides down to allow user to select another window from “virtual cabinet” behind it to take its place

http://dx.doi.org/10.1145/2470654.2470680  
http://www.youtube.com/watch?v=HlkewQGh1IE

Feiner, COMS W4172, Spring 2016
**Personal Cockpit**  B. Ens, R. Finnegan, P. Irangi, CHI 2014

- Exploration of layout and interaction with arrays of window in AR
- Accounting for
  - asymmetric interaction around the body
  - Limited FOV

https://www.youtube.com/watch?v=L0ZjmEP-c1E

**More....**

- www.3dtop.com/
- www.marcmoini.com/3_en.html
- www.cubioeye.net/
- www.compiz.org
And even more....

Microsoft, Apple, Linux, Android

- **Compositing window managers** (e.g., Microsoft “Desktop Window Manager”) appear 2001–2007
  - Each window is rendered to a separate off-screen buffer
  - Window manager composites buffers to create final desktop, so user can
    - View one window’s pixels through another window (and process the pixels; e.g., to blur)
  - 3D possibilities
    - Texture-map a 3D polygon with a window’s texture
    - Transform a window’s polygon in 3D

- Flip 3D (Windows 7, but not 8)
- 3D dock [OS X Leopard,...]
- Cover Flow [iP{hone,od], Os X]
Microsoft, Apple, Linux, Android

SPB Shell 3D [Android]  Regina 3D Launcher [Android]