



UI Year 2020



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Ubuntu FOSScamp
December 6, 2008
1pm-2pm

Location:
Google, Inc.
Crittenden Campus, Bavorr Room
1400 Crittenden Lane
Mountain View, CA 94043

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Future User Interfaces

- How much longer will we be WIMPs?
 - Windows, Icons, Menus and Pointer
- The interface as you know it is over
- Research labs have been busy for a decade
- Defense apps not transitioning to commercial
- Industry is a decade behind labs
- Opportunity for FOSS to leap ahead

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State of the Art in UI

- Keyboard
- Mouse
- NIC
- Game port
- MIDI
- Microphone (why can't we record birds right?)
- Speaker
- Touchscreen/tablets
- Webcam, Logitech tracking cam
- Wii
- iPhone

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What's Next in UI

- Research labs and Hollywood showing the way
- Gesture
- Speech
- Conversational AI
- Image AI
- HUD, 3D
- New io devices

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Chani Is Our Poster Child

- The future is already here
- Multi-device, multi-display, multi-conversation
- Chani holding 3½ simultaneous conversations
 - In hallway at FOSScamp in conversation with two people, while simultaneously...
 - One audio conversation on phone..
 - Me observing and listening
 - We're a little confused who Chani is talking to, she has no trouble multi-tasking

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Gesture Interfaces

- Image tracking
- Mo-cap
- Image stabilization
- Input devices
 - Video cameras
 - Accelerometers
 - Magnets, sensor grids

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Speech Interfaces

- TTS: transcription
 - Cheap microphones
 - Noisy environments, GIGO
- STT: voice synthesis
 - Stephen Hawkings
- Speech state of the art is broken
 - CMU HMN neural net architecture flawed
 - Need to model on human hearing (like MP3)
 - Need prosodics, detect words, punctuation

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Relevant AI

- Converstational, as in the film *Iron Man, 2001...*
- Eliza is amazing, yet dumb
- Eliza + Google = much smarter
- Image AI, as in the film *Iron Man*
 - Image tracking is first step
 - Image identification
- Gisting, infer summary or question
 - Google does by spell-checking queries

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HUD and 3D

- HUD and 3D in movies
 - *Iron Man*
 - *Quantum of Solace*
- 3D projection
 - Autoglyph red/cyan glasses
 - Polarizing glasses
 - Shutter glasses
 - Volumetric projection, no glasses
- HUD
 - Already using heads-up multi-display with simultaneous iPhone and laptop displays
- Projector mobile phones coming (Samsung) 9/14



New UI devices

- Projector mobile phones
 - Seeing at tradeshow now
- Logitech tracking webcam
- Force feedback game controls
- Touchpad gesture control
- Smart pen



Big Ideas Can Work

- OLPC
- iPhone
- Mouse

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Opposing Arguments

- Can't be done, too hard
 - That's what they said about Linux
- Not worth doing, love WIMP UI
 - More fun to do UI Y2020, can look beyond the next gadget for KDE/GNOME desktop
- We'll all have iPhones instead of computers
 - So do it in Android
- If it's worth doing, let commercial software do it first, then we'll build open source knock-offs
 - Open source can out-innovate closed when we try (e.g., ZFS)

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What Could We Do Now?

- Using existing hardware
 - Webcam gesture tracking
 - Wave hand and window moves on desktop like *Quantum of Solace*
 - Virtual keyboard: like iTech
 - Speaker: TTS
 - Microphone: STT
- Conversational AI
 - Integrate Eliza with Google
- Image AI
 - Could use university research
- Gisting

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THANK YOU!

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