UbiSketch: Ubiquitous Real Time Sketch-Based Communication

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System Overview

A mixed paper/digital infrastructure
• Leverage affordances of pens, paper, and mobile phones
• Platform for developing novel applications supporting lightweight visual communication
• Potential to support novel interactions for quick, easy, sharing of paper-based information in networked environments

Mobile phones are shifting social practices
• Mobile devices are becoming central communication tools
• Networked mobile applications are shifting practices for communication and group awareness
• Interaction is limited by small screens, keyboards

Pens and paper are ubiquitous
• Paper is inexpensive, portable, flexible, high-resolution
• Pens commonly carried, used to annotate paper documents
• Digital pens can digitize paper-based input

Sketch-based communication
A communication practice that involves sharing visual content created by hand with a stylus on a surface.

Why?
• Express feelings, relieve boredom (aids memory and focus)
• Externalize ideas for sharing, discussing, revising
• Quick, timely, inexpensive, disposable, show hand-writing

How?
• Paper: Quick, natural, but hard to search, store, edit, transmit
• Digital: Easy to search, store, edit, transmit, but feels different
• Mixed: Exploit combined affordances of paper and digital

Study Setup

We observed users’ experiences with a working prototype and conducted an evaluation of the system’s UI. We created SketchBook, an application that uploads paper-based sketches directly to Facebook.

Observations

Sketching experiences

Procedure
Initial interview, sketching task, observation of Facebook interactions, follow-up interview

Results
• Sketching felt natural with digital pen and paper UI
• Publishing sketches was easy, fun, led to social interaction
• Positive responses eased users’ initial hesitation

Feedback on user interface

Procedure
Feedback on paper UIs, description of ideal interface

Results
• Sketching area should be maximized
• Digitized sketch should capture detail of original
• Paper UI should be portable, simple, easy, primary interface
• Phone UI should provide feedback, optional interaction

Future directions

• Field study to understand sketch-based communication
• Revised user interface design
• Extensions: gesture-based interaction, re-print and append (collaboration), visualization (location, speed, force)