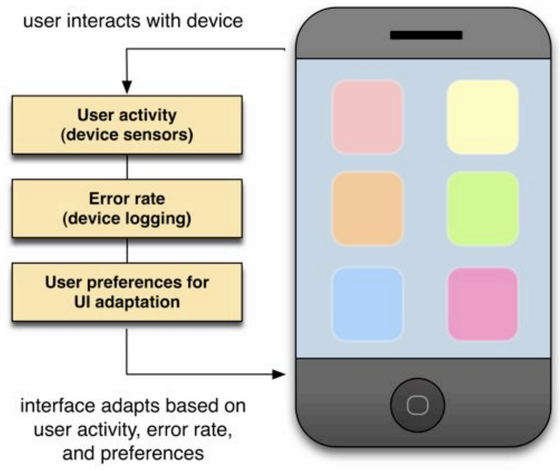
Context-Enhanced Interaction Techniques for More Accessible Mobile Phones

Problem: Mobile device user interfaces can be difficult to use for people with visual and motor impairments, and for all users when moving around in the world.

Proposed Solution: **Mobile adaptive widgets** replace standard interface widgets (e.g. touch keyboard, scroll bars) and provide accessibility features such as typing correction, scalable text, and audio feedback. These features can be adjusted by the user based on their needs, and can provide additional assistance based on the user's context (e.g. location, movement).

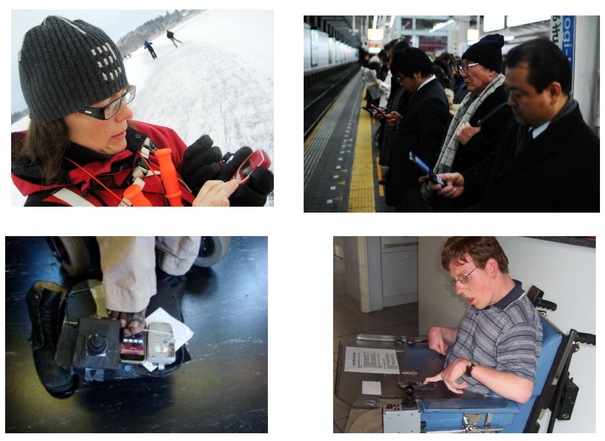


Mobile adaptive widgets combine users' UI preferences and information about the user's context to create a more accessible user interface.

Using context and adaptation to improve accessibility

Using a mobile device on-the-move can impair performance for users with and without disabilities. In response, **mobile adaptive widgets** draw on the user's context to adapt the mobile device interface and improve usability and accessibility.

Contextual factor	Negative effects	Adaptation
Location	New locations can be confusing or distracting	Reorder device menus based on location
Body movement	Reduces reading speed and motor precision	Resize on-screen text; increase soft-button size
Distracting environment	Reduces attention	Activate multimodal feedback (audio, haptic)



Users with physical and sensory impairments may have similar difficulties interacting with a device as users in distracting or extreme environments.

Proposed research

Understand mobile use

- Field observation of motor- and visually-impaired mobile device users
- Observe information needs and problems
- Identify opportunities for using context sensing to improve usability

Develop prototypes

- Recruit participatory design group with motor and visual impairments
- Develop lo-fi prototypes of mobile adaptive widgets
- Implement prototype designs on mobile platform

Evaluate system

- Evaluate individual widgets in the lab with users
- When possible, install prototype software on users' devices
- Test designs for users with and without disabilities

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