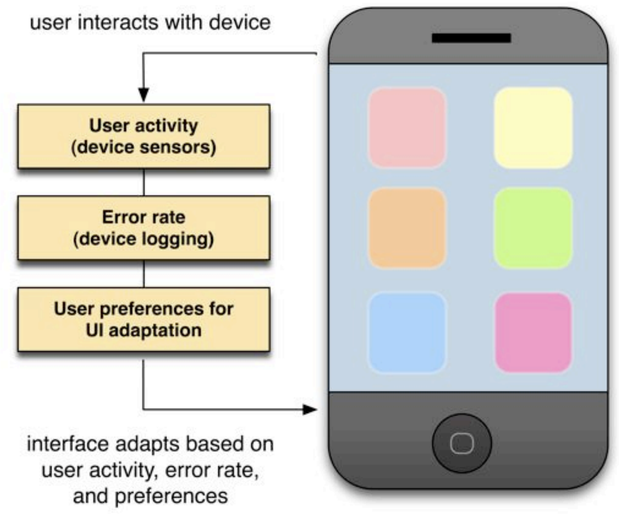
# Improving Mobile Phone Accessibility with Adaptive User Interfaces

**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:** Develop a framework of adaptive interaction techniques that use information about the user's abilities, preferences, and context (e.g. location, activity, routine) to provide an interface customized for that user. This will reduce the difficulty of managing accessibility features and produce more accessible user interfaces.

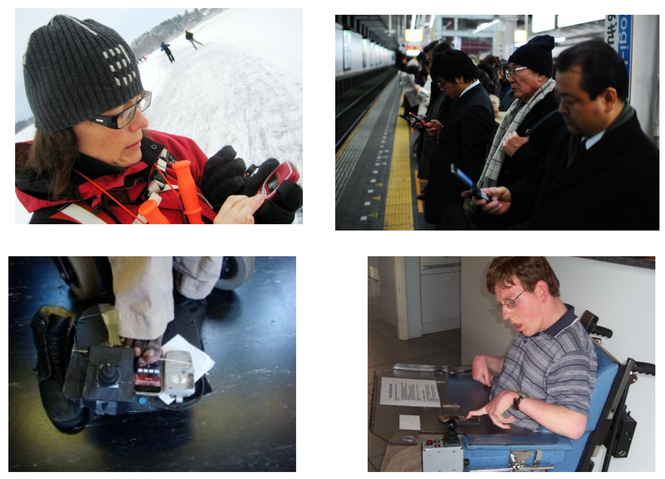



An adaptive mobile phone user interface can combine information about the user's context with their accessibility needs to improve overall accessibility.

## Using context and adaptation to improve accessibility

Using a mobile device on-the-go can create accessibility issues for all users. However, understanding a user's context can enable designers to adapt a user interface to the current situation, thereby improving usability and accessibility.

| Situation | Impairing effects | Interface adaptations |
|---|---|---|
| User is in motion | Reading ability is reduced | Increase text size; activate text-to-speech |
| User is inside a busy train station | Attention is reduced; crowds impair movement | Automatically launch train schedule application |
| User is riding on a bumpy train | On-screen targets difficult to hit while moving | Increase on-screen target size; activate error correction |



Accessibility problems experienced by all users may be exacerbated by environmental factors such as crowded spaces, inclement weather, or motion.

## Proposed research

### Understand mobile use

- Explore current accessibility problems for people with disabilities
- Understand information needs for future mobile devices
- Identify how context can reduce accessibility

### Design interventions

- Recruit participatory design group with motor and visual impairments
- Develop lo-fi prototypes of new accessible user interfaces
- Build interactive prototypes using mainstream devices

### Evaluate potential designs

- Measure performance and usability in the lab
- Test successful designs in the wild
- Produce downloadable software releases for current mobile devices

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