

# Interfaces for disabled and people with special needs

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- 1 Introduction
- 2 Systems for disabled people
  - Movement disabilities example
  - Deaf people example
- 3 Web accessibility
  - What is web accessibility?
  - How make your website accessible?
- 4 Conclusion

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# Introduction

- **Disabilities:**
  - blind - eye impaired
  - deaf - hear impaired
  - movement disabilities
  - elder people
- **computing:**
  - tool to make "information systems"
  - more and more important (with the Internet)
- **necessary to make disabled people have access to content**
  - ethical need: enable them to integrate in the world
  - business aspect:
    - "large and growing market"
    - 5% US people have a disability

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# Context of movement disabilities

- Movement impaired people
  - shake problems
  - paralyzed people
  - amputated people
- Problem: make (proper) movements
  - mouse movements
  - keyboard strike
- Some systems developed to prevent that use of a computer
  - voice recognition systems
  - eyes navigation systems
  - head navigation systems

# Voice recognition systems (1/2)

## Principle and current state

- Principle:
  - the person speak to give order to the computer
  - the computer acquires the sound and compiles it
  - matching with an existing order and order execution
- State of the art:
  - difficult to make working systems
  - depends on a lot of factors (emotion, tone...)
  - research progressing
    - example: team in finland studied the inuence of encoding / decoding on the quality and the deformation of the spech

# Voice recognition systems (2/2)

## Current implementations

- Current implementations:
  - some exist in mainstream OS but don't work perfectly
    - Microsoft Windows Vista
    - Apple Mac OS X
  - exists dedicated system to that
    - around \$200 for a full system
    - begins to become mainstream

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# Generalities about deaf people

- Disability:
  - completely deaf
  - only hear-impaired people
- Systems: computer → people
  - put sound louder
  - replace sound feedback by display feedback
  - subtitles for movies
- Systems: people → computer
  - classic means
    - mice
    - keyboards
  - *Cued speech*

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# Cued speech (1/2)

## Principle

- What is *Cued speech*?
  - language using hands
  - very old and improved method
  - very used to communicate in real life
  - idea: integrate it in Information Systems
- Why integrate *Cued speech* in IS?
  - increase people → computer communication possibilities
  - main idea: enable instant-chat conversations



# Cued speech (2/2)

## Implementation

- How doing it?
  - video means: webcams, . . .
  - compiling hand-made symbols to make corresponding sounds
    - study lead by French and Greek researchers on 2D/3D pictures
    - conclusions: 2D recognition have less noise than 3D
- This solution has a future
  - improved, easy to deploy
  - cheap to deploy

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# Definition of accessibility

- Make content reach the user, whoever the user is;
  - “accessibility is just usability but marketed to a particular segment of the population” (Jonathan SNOOK)
- More general than only access for disabled people;
  - Cf. the W3C definition of accessibility

# For the Web

- For the web: make the browser print / read contents
  - classical graphic web browser
    - Firefox, Opera, Netscape, Konqueror...
  - text (in-line) browser
    - like Lynx
  - non-computer browsers
    - like wap browsers on mobile phones...
  - special browsers for disabilities
    - voice browsers
    - braille displayers

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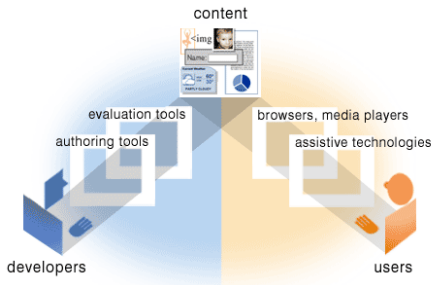
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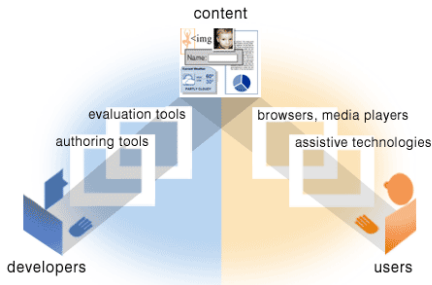
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# The problematic of web accessibility



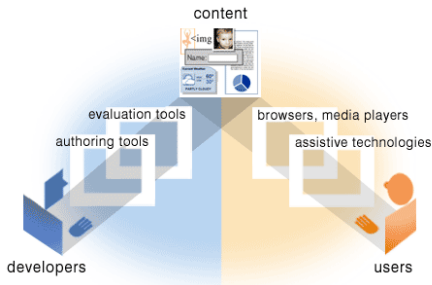
- Information flow: between the webmaster and the user
- goal: don't interrupt that flow
- how?
  - guidelines, standards. . .
  - validation tools to ensure standards
  - W3C: reference consortium for that

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# Main principles

- Content: split the content from the presentation
  - content described by (X)HTML
  - presentation implemented by CSS
  - no content in Javascript effects
- Navigation: follow accessibility guidelines
  - place navigation links in the *beginning* of the page
  - don't place navigation elements (menu items. . . ) in dynamic effects (like Javascript)
- Check you comply with that (through W3C validators)

# Splitting content/presentation examples

- Put a text fragment in emphasis
  - Bad: I want to put `<i>that text</i>` in emphasis
  - Good: I want to put `<em>that text</em>` in emphasis
- Modify text font and color
  - Bad: `<font size="1" color="#00FF00">Hello World!</font>`
  - Good: `<span style="font-size:11pt; font-color:#00FF00;">Hello World!</span>`

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- Provide an alternative for multimedia supports
  - Bad: ``
  - Good: ``
- Use markup properly: titles
  - Bad: `<p><strong>My title</strong></p>`
  - Good: `<h1>My title</h1>`

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# Conclusion

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- Exist already systems for disabled people
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    - already implemented, but really improvable
  - Deaf people
    - example of *Cued Speech* (enable chat)
    - easy and cheap to deploy
- Case of the Internet
  - accessibility: any user able to reach content
  - for the web: don't break the information flow
  - make websites accessible:
    - separate look-and-feel (CSS) from content (XHTML)
    - follow W3C accessibility guidelines

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Thanks for your attention!