Game accessibility

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Roadmap

- Handicap, impairement, disabilities
- Social (and legal) context
- Motor and sensory impairements
- Cognitive impairement
- Guidelines (basic)
- Hardware solutions
- Interfaces adaptations
- Game design approach

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  - Human computer interactions/interfaces
  - Video games
  - Accessibility
  - Physical computing

Terminology

- The words ‘impairment’, ‘disability’, and ‘handicap’ are not synonymous [3, 9]. The following is taken from the American Psychological Association Online Style Manual [3]:
- **Impairment** is used to characterize a physical, mental or physiological loss, abnormality or injury that causes a limitation in one or more major life functions. For example, “The loss of her right arm was only a slight impairment to her ability to drive.”
- **Disability** refers to a functional limitation that affects an individual’s ability to perform certain functions. For example, it is correct to say, “Despite his disability, he still was able to maintain employment.”
- **Handicap** describes a barrier or problem created by society or the environment. For example, “The teacher’s negative attitude was a handicap to her.” Or, “The stairs leading to the stage were a handicap to him.”
- A disability is a measurable impairment or limitation that “interferes with a person’s ability, for example, to walk, lift, hear, or learn. It may refer to a physical, sensory, or mental condition” (Schiefelbusch Institute, 1996).

http://www.sigaccess.org/community/writing_guidelines/

Social (and legal) context

- There are more than 60 million disabled individuals in the United States.
- There are around 11 million people with disabilities in the United Kingdom.
- This represents roughly 20% of the population of both countries.

- The Entertainment Software Association 2011 Gamers Essential Survey suggested that 72% of the population are gamers.

- Over 1 billion people have some form of a disability worldwide.
- Moderate to severe mobility impairments make up three quarters of the total disabled community.

Social (and legal) context

- Most accessibility features are cheap and easy.
  - Some of them can be considered expensive.
- However, it will take minimal time, effort and funding to implement, especially if done in the beginning of the development cycle.

Social (and legal) context

Motor

- Allow controls to be remapped / reconfigured
  - Standard for PC games but rare on consoles, remappable controls are one of the best value accessibility features.
  - Many people with motor impairments, whether permanent (eg. stroke), temporary (eg. broken arm) or situational (talking on a phone while playing) benefit greatly from being able to move essential controls into positions that they are able to reach more easily, for example with a single hand, or resting on a table-top using only the top buttons. It also benefits the huge numbers of people who simply prefer playing with their own set-up.
  - **Best practice examples:**
    - Counterstrike: Global Offensive
    - Street Fighter IV

Motor

- Include an option to adjust the sensitivity of controls
  - Although PC/Mac operating systems offer sensitivity controls, these are within system settings which are only seen by advanced users, and consoles do not offer a system-wide setting at all. Different games also require different levels of sensitivity. Allow players to set it at game level, and offer a wide range of sensitivity.
  - **Best practice examples:**
    - Counterstrike: Global Offensive
    - Speedball 2 Evolution

Motor

- Ensure that all areas of the user interface can be accessed using the same input method as the gameplay
  - If for example you have designed gameplay controls for a choice of either keyboard or joypad, ensure that all menus also work for both keyboard and joypad, or if you've designed gameplay controls that work solely using Kinect, ensure your menus can also be controlled solely by using Kinect.

Motor

- Ensure controls are as simple as possible, or provide a simpler alternative
  - Don’t use buttons/keys just because they’re there, more complex control schemes require higher degrees of both motor and cognitive skill. Sometimes this is desirable, but simpler alternatives can still be offered.
  - **Best practice examples:**
    - Bayonetta
    - Fifa 13

Cognitive

- Allow the game to be started without the need to navigate through multiple levels of menus
  - Understanding and navigating through complex menus can present a significant barrier to entry, for example having to work through many levels of team formation, country, kit etc. in a sports game. Although pre-game config can be of great value to many players, providing a quick start option will open it up to many more.
  - **Best practice example:**
    - Civilization V

Cognitive

- Use an easily readable default font size
  - Small text size is a very common complaint amongst people with visual impairments, whether medical (such as long sightedness) or situational (such as small mobile screen). Allowing a choice of font size is the ideal solution, but as this is difficult to implement, setting a large default size is a good first step.
  - Small fonts are not only difficult to see, they are also more difficult to read, due to the differences between letter shapes being less pronounced at smaller pixel sizes.

(Both Vision and Cognitive)

Cognitive

- Use simple clear language
  - Aim for as straightforward language as your copy style allows, for example “Click below to save your character” rather than “If you click below your chosen character preferences will be saved”

Cognitive

- Use simple clear text formatting
  - For short passages of text, just an easy to read font over an unfussy background makes a big difference to readability, ideally a font with distinct letter shapes and prominent ascenders and descenders (Vision)
  - For longer blocks of text, in addition to the above, aim for camel case rather than all caps, unjustified left aligment, and around 70 characters per line.
  - There are fonts available that have been designed specifically for easy legibility. Offering one of these as either the default or an alternative can make a huge difference (Cognitive)
  - **Best practice examples:**
    - The Last Door
  - **More information:**
    - Dyslexia-friendly typography
  - **Resources:**
    - OpenDyslexic (Free)

Cognitive

- Include tutorials
  - Guided step by step tuition is far more effective for all players than a simple instructions screen.
  - **Best practice example:**
    - Diablo 3

Cognitive

- Allow players to progress through text prompts at their own pace
  - In addition to low reading age being extremely common (15% of adults have a reading age of below 11 years), distraction can be an issue for all gamers, sometimes resulting in key information being missed. As reading speeds and ability are so varied even within very specific age brackets, it is not possible to set a speed for text to be displayed which will be appropriate for all readers.
  - Instead of a timer, dismiss information on a player action, allowing it to be stepped through. If that's not possible, allow it to to be replayed or paused. Any of those methods remove the requirement for players to have a specific reading speed and constantly maintained attention.
  - **Best practice example:**
    - Awakening: The Dreamless Castle

Vision

- Ensure no essential information is conveyed by a colour alone
  - Colours are useful means of communicating with well established meanings. However these meanings vary between countries and are lost on people who can't distinguish between certain colours.
  - Red-green colour deficiency in particular is very common, affecting around 8-10% of males, making both green and red look a brownish green, and there are several other less common forms that affect other colours.
  - Wherever you can, use colour as a back-up for another means of communicating the information, such as text or a symbol. For instances where this isn't possible, ie. online multiplayer where there's no chance to recognise a symbol before you're dead, offer a choice of colour schemes, and test those schemes with a simulator (and also ideally colorblind gamers, there are likely to be some in your office).
  - Some colours also appear darker than without colour deficiency (most commonly red) so check for foreground/background contrast too.
  - **Best practice examples:**
    - Grand Theft Auto map (integrated use of symbols)
    - FTL (separate mode for alternative colours and use of pattern)
  - **More information:** Red/green colour-blindness simulation
    Tool: Realtime colour-blindness simulator app (Android)

Vision

- If the game uses field of view (3D engine only), set an appropriate default for the expected viewing environment
  - Field of view is the simulated viewing angle through the camera, ie. perspective.
  - Every 3D game has a field of view set. If the field of view is significantly different to what the eye/brain expects to see, it can result in motion sickness. This can be extreme, resulting in nausea and disorentation strong enough that play duration in excess of a few minutes can become impossible.
  - An appropriate viewing angle is usually 60 degrees for TV, 90 degrees for monitor.
  - **More information:**
    - FOV in games video

Vision

- Provide high contrast between text and background
  - Low contrast is a very common complaint. There are several common vision impairments that specifically result in a loss of contrast sensitivity.
  - Very high contrast can cause problems for a certain type of dyslexia, but even if you offer a choice of colour combinations if you can, it is best to keep the default high.
  - **Note:**
    - There is a common misconception that high contrast text can trigger epileptic fits. This is incorrect, according to the makers of the Harding test (used by many game studios) text contrast on its own has no effect on pattern related epilepsy. Harding test fails can be resolved by maintaining contrast, increasing font size, reducing line spacing, or ensuring regular well spaced paragraph breaks.

Hearing

- Provide separate volume controls or mutes for effects, speech and background / music
  - Loss of hearing can affect certain frequencies more than others, so being able to control volume independently is essential.
  - Being able to distinguish individual sounds is particularly important when visual cues are not able to be detected as easily (vision)
  - Too many different sources of information can make it difficult to focus on any of them. There is even a specific condition (auditory processing disorder) for which simultaneous sounds can be impossible to distinguish or even distressing (cognitive)
  - **Best practice example:**
    - Diablo 3

Hearing

- Ensure no essential information is conveyed by audio alone, reinforce with text / visuals
  - Essential information means something you absolutely can’t play the game without.
  - Get someone to play through for the first time with the sound muted. If at any point they’re unable to progress due to information being missed, it needs to be conveyed by another means.

Hearing

- If any subtitles / captions are used, use an easily readable default font size, simple clear text formatting and provide high contrast between text and background
  - The same guidance applies to subtitles as other text (contrast, text formatting, font size).
  - Subtitles / captions can often become unreadable due to small / poor choice of font, or displaying white text directly over gameplay without any letterboxing (fully or semi opaque surrounding box).
  - Subtitles/captions are used for many reasons by a large number of players, including players with visual and cognitive impairments.

Speech

- Ensure that speech input is not required, and included only as a supplementary / alternative input method
  - Relying on speech recognition excludes all players who are either physically unable to speak, physically unable to speak to an accurate enough level to be picked up by voice recognition, or cognitively unable to understand language.
  - To avoid exclusion, also provide controls / menu options for all voice commands.

General

- Provide details of accessibility features on packaging and/or website
  - Buying a game only to find out that you can’t play it is a real issue, easily solved by just letting people know what features are in a game. Without that, the work on those features may well go to waste.
  - Mentioning key accessibility features online also gets you extra search engine traffic, for example from people searching Google for colour-blind friendly games.
  - A standardised symbol has been developed to indicate that accessibility information is present. Use of this will aid recognition.

General

- Offer a wide choice of difficulty levels
  - Offering a simple choice of difficulty is a good first step, allowing some flexibility in the main challenge involved, such as level of AI, speed of enemies or difficulty of puzzles. This can be taken further by offering more detailed options for individual elements of game difficulty. Allow as wide a choice as possible, from very easy to hardcore.
  - Best practice example:
    - Silent Hill 2
    - Gears of War 3

General

- Ensure that all settings are saved/remembered
  - Customising settings can be a very long and difficult task for a number of different impairments.
  - Remembering settings for subsequent sessions avoids this.

Hardware solutions

Hardware solutions

Hardware solutions





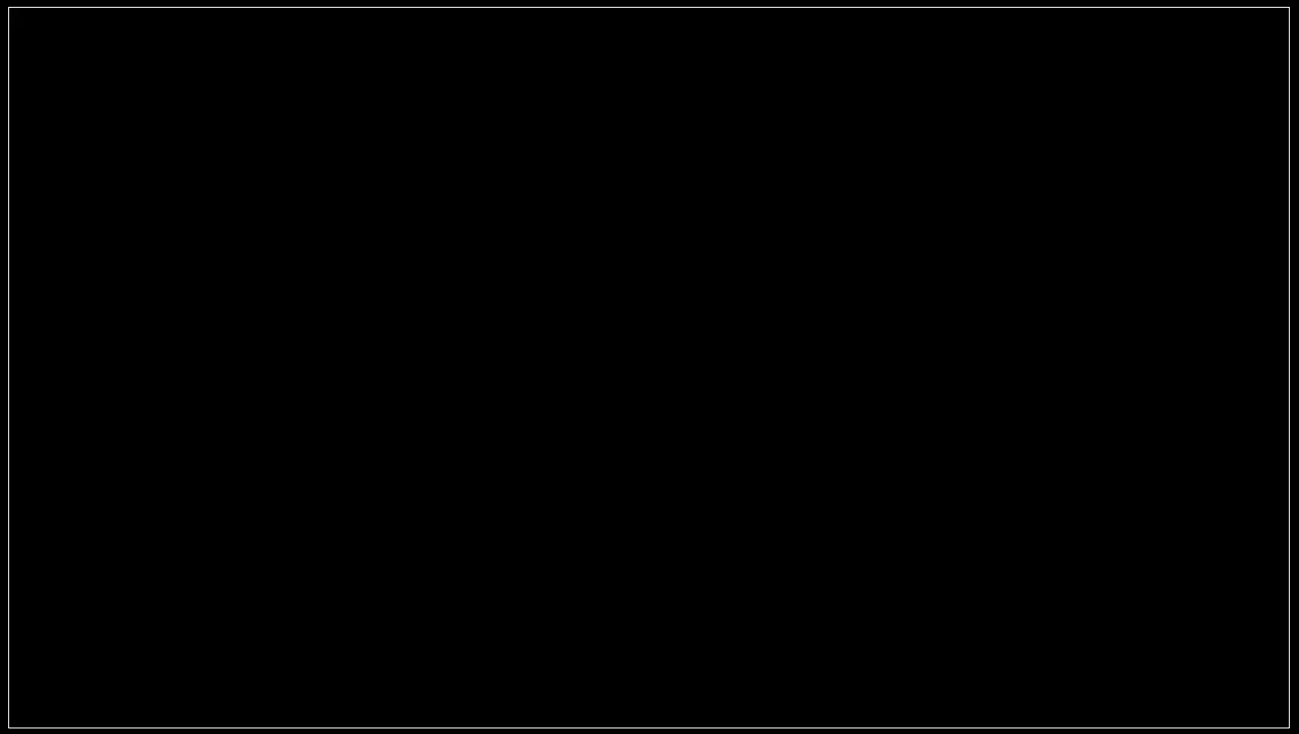




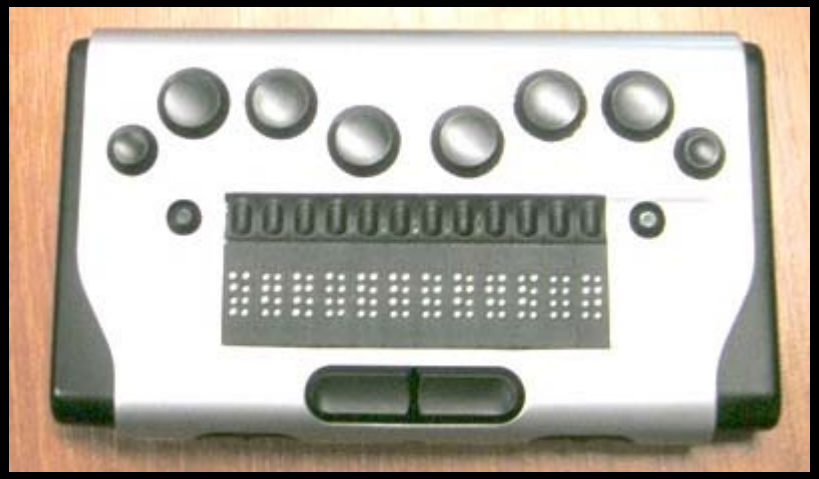

http://www.suppleance.fr/

Hardware solutions

Hardware solutions



Hardware solutions

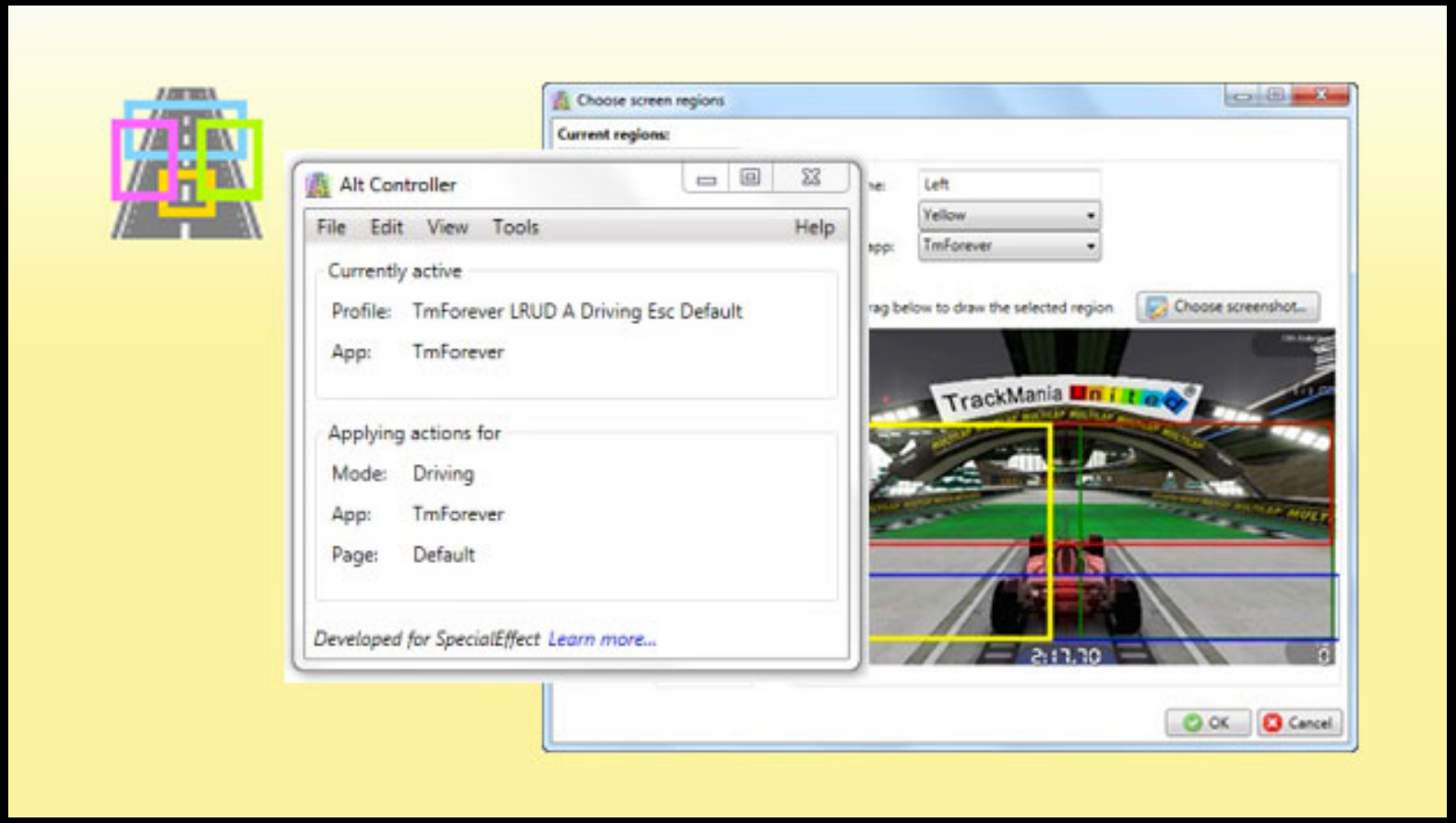


Hardware solutions

Leap motion ?

Resaerch on human computer interaction

Software solutions



http://altcontroller.net/home.aspx

Game design approach

- Thinking accessibility at the begining of the development process
- Exploring asymetrical game play
- Exploring multiplayer (collaborative or competitive) mode

Game design approach

- OneSwitch.org.uk

  Game Not Over

  Video games are fun and also give people the power to do amazing things that they would be unable to in real life.

  With the right specialised hardware, many standard video games can be played by anyone, no matter the disability. "One Switch Gaming" is especially interested in games playable with a single switch, and in campaigning for accessibility features in all games.

Game design approach

- EBMMA
  - Evil Blind Mutant Monster Attack

Play time

- Evil Blind Mutant Monster Attack
  - http://dl.dropbox.com/u/15229476/Evil%20Blind%20Mutant%20Monster%20Attack.zip
- Terraformers
  - http://terraformers.nu/?page_id=5
- Invasion Force
  - http://www.oneswitch.org.uk/2/sd-arcade.htm

Game design approach

- Next Accessible Game Design Contest

Openning soon…

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