

Copyright © 2010 by Dimitris Grammenos

First edition (online): 9 December 2010



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs License 3.0

<http://creativecommons.org/licenses/by-nc-nd/3.0/>

You are free:



to Share — to copy, distribute and transmit the work.

Under the following conditions:



Attribution — You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).



Noncommercial — You may not use this work for commercial purposes.



No Derivative Works — You may not alter, transform, or build upon this work.

You can download this file from ➔ <http://ua-games.gr/publications.html>



Hello! I'm Dimitris Grammenos and I am a researcher at the Institute of Computer Science of FORTH.

This is a small subset (31 slides) of my presentation entitled "Universally Accessible Games & Parallel Game Universes" (206 slides), meant to be used as a quick introduction to Game Accessibility. You can download the full version from:

<http://ua-games.gr/publications.html>

If you liked, hated, or used this presentation, or if you have any questions or comments, please e-mail me at:

gramenos@ics.forth.gr



Game Accessibility



Dimitris Grammenos
gramenos@ics.forth.gr

Institute of Computer Science
Foundation for Research &
Technology – Hellas (FORTH)

<http://ics.forth.gr/hci/people/dgrammenos.html>

A photograph of a blue rectangular sign with a white handicapped symbol in the center. The sign is mounted on a pole and set against a clear blue sky. In the bottom left corner, the roof of a green wooden building is visible.

Computer Accessibility

- Term traditionally associated with access to computer-based systems by people with **physical**, **sensory** or **mental** disabilities
- + In this presentation also encompasses people with “diversified needs”, due to:
 - ▶ the environment they operate in
 - ▶ the devices / software they use
 - ▶ their abilities or preferences



(Video) Game Accessibility

- Being able to play a game
 - ▶ Even when playing under “limiting conditions”, or having “diversified needs”
 - Limiting conditions
 - ▶ Disabilities
 - Permanent
 - Temporary
- GA = Game Accessibility

A photograph of a woman with blonde hair and blue eyes, wearing an orange and blue striped sweater, laughing heartily. She is holding a blue video game controller. Next to her is a young girl with blonde hair, also laughing. The girl is wearing a green long-sleeved shirt and is also holding a blue video game controller. They are both sitting on a white, textured rug. In the background, there is a white door.

Diversified needs

- Non(-native) language
- Left- / single-handed
- Bright / loud / quiet /... environment
- On the move
- Novice / casual / tired / young / old
- I/O devices
 - ▶ Touchpad, mobile screen, TV too far, keyboard key not working, “other” joystick,

Disabilities affecting GA



- Vision
- Motion
- Hearing
- Cognitive
- Speech
- Illiteracy

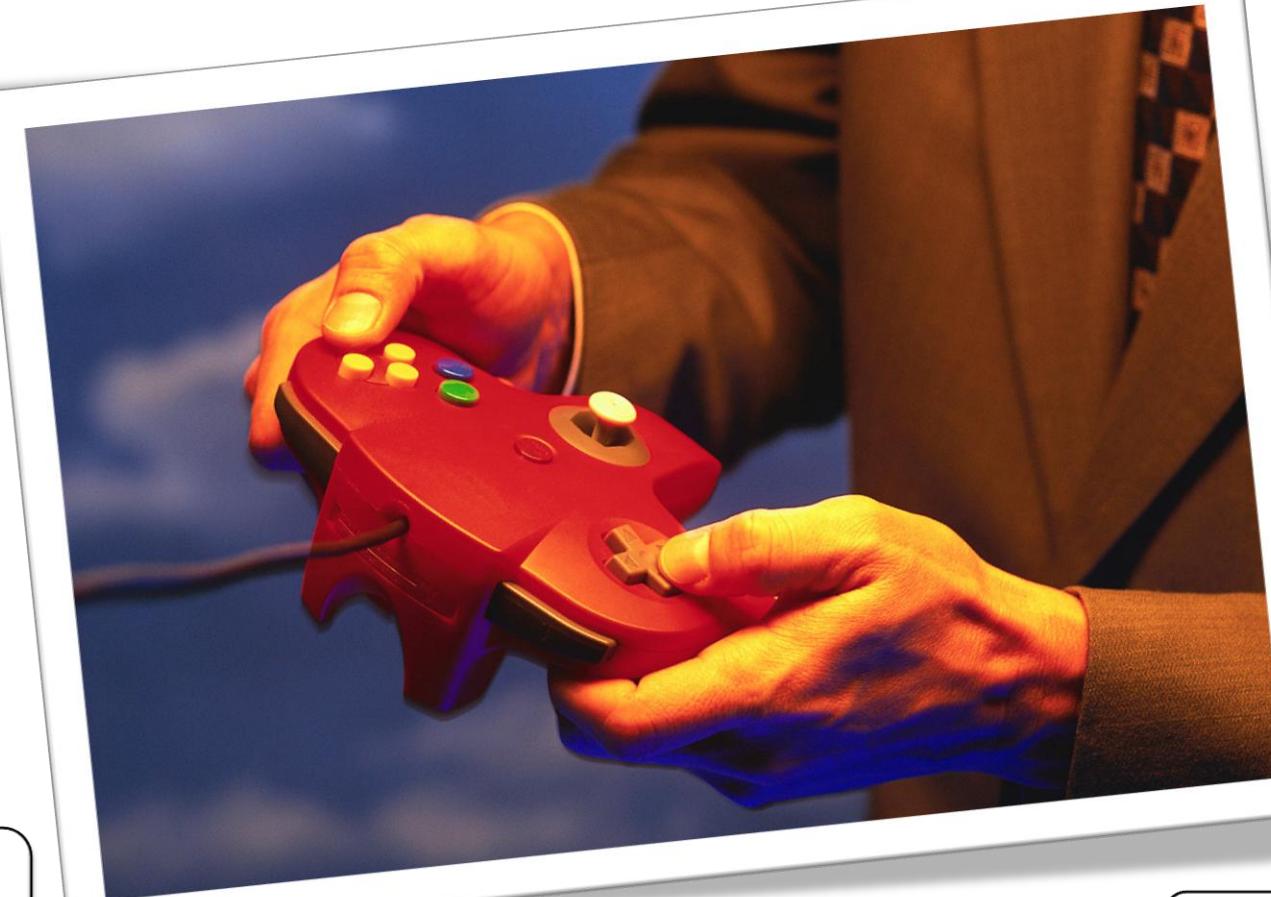
-
- ▶ Age-related disabilities are frequently referred to as a separate category
 - ▶ all related problems fall within some of the above categories



Typical GA problems

- Providing input
 - Receiving feedback
 - ▶ And properly processing & understanding it...
 - Determining what to do
-
- ➔ May range from annoying to making playing impossible

Providing input



Teenager
with no
disabilities

Adult

Novice player

Hand-motor
impaired

EASY

CHALLENGING

HARD

IMPOSSIBLE

Receiving feedback



Perfect vision

Elderly

Low-vision

Blind

EASY

CHALLENGING

HARD

IMPOSSIBLE

Processing & understanding feedback



Perfect vision +
using big TV

Mobile phone

Mild cognitive
impairments

Color-blind

EASY

CHALLENGING

HARD

IMPOSSIBLE

Determining what to do



Expert
strategy
games player

Novice player

Me

Cognitive
impaired



EASY



CHALLENGING



HARD



IMPOSSIBLE



World of Warcraft (Blizzard Entertainment)



Doom3 [CC] mod by Games[CC] for Doom 3 (id Software)



Strange Attractors 2 (Ominous Development)

What kind of games?

- “Mainstream” commercial games
 - ▶ PCs, consoles, mobile, on-line, ...
 - ▶ No particular accessibility considerations – various types of “adaptations” employed

■ “Special” games

- ▶ Developed to be accessible by specific user categories
 - ◆ One-switch, audio-only, etc.
- ▶ Commercial (usually Indy) or public domain

How?

- Very often, with great difficulty
 - ▶ A lot of patience, extraordinary dedication & passion
- “Adaptations”
 - ▶ Special devices
 - Commercial
 - Custom- (home)-made
 - ▶ Special software
 - ▶ Hacking & tricks
 - ▶ Help of another person



[http://kotaku.com/5082293/
handicapped-ps3-owner-builds-frankenstein-s-controller](http://kotaku.com/5082293/handicapped-ps3-owner-builds-frankenstein-s-controller)



<http://www.gamesaccessibilityday.org/>



<http://www.eelke.com/blindhero.html>

Overview of GA Solutions (1/5)



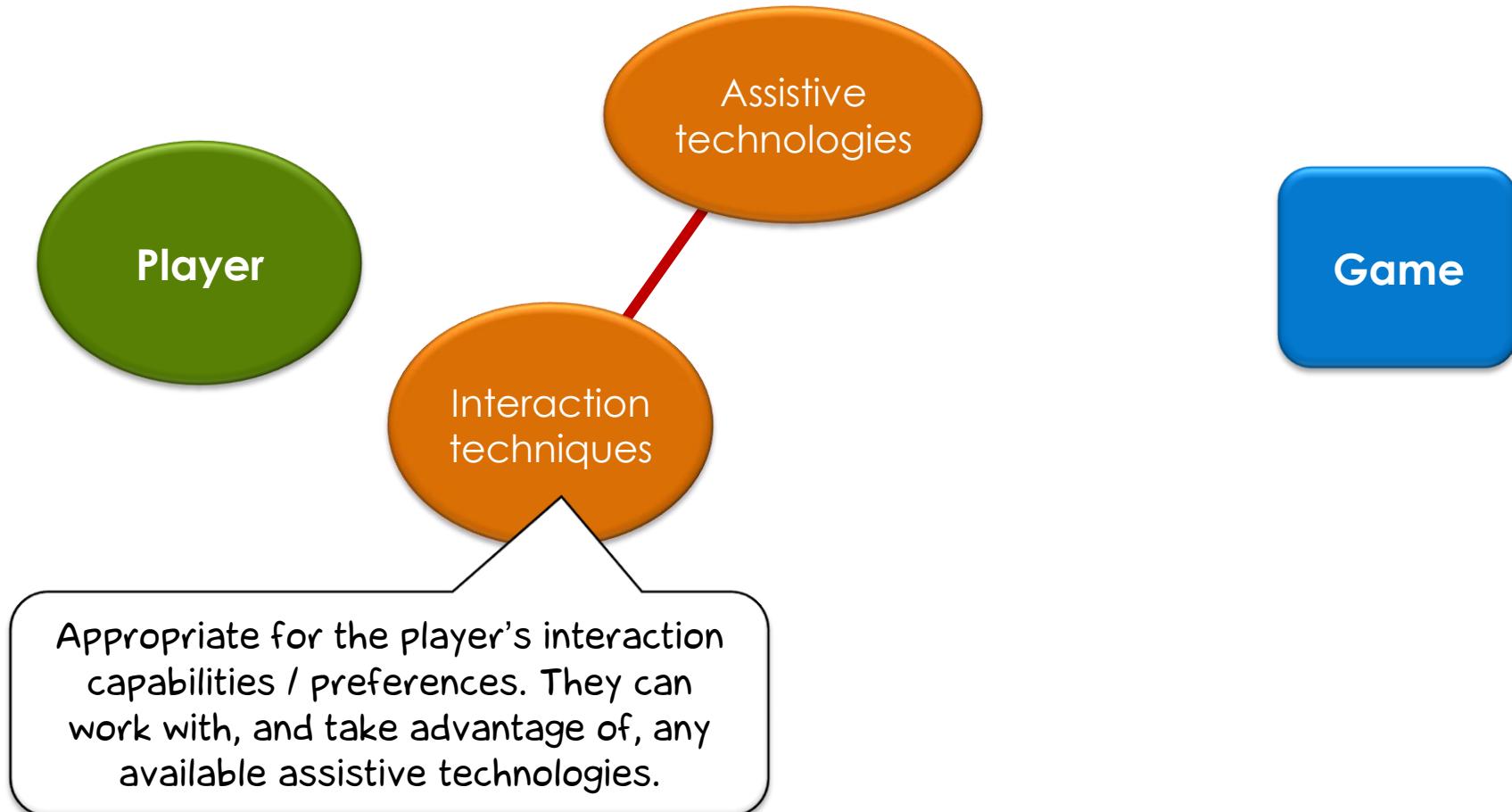
As a designer, there are 3 complementary tools that you have at hand, when you want to make a game accessible to a specific player.



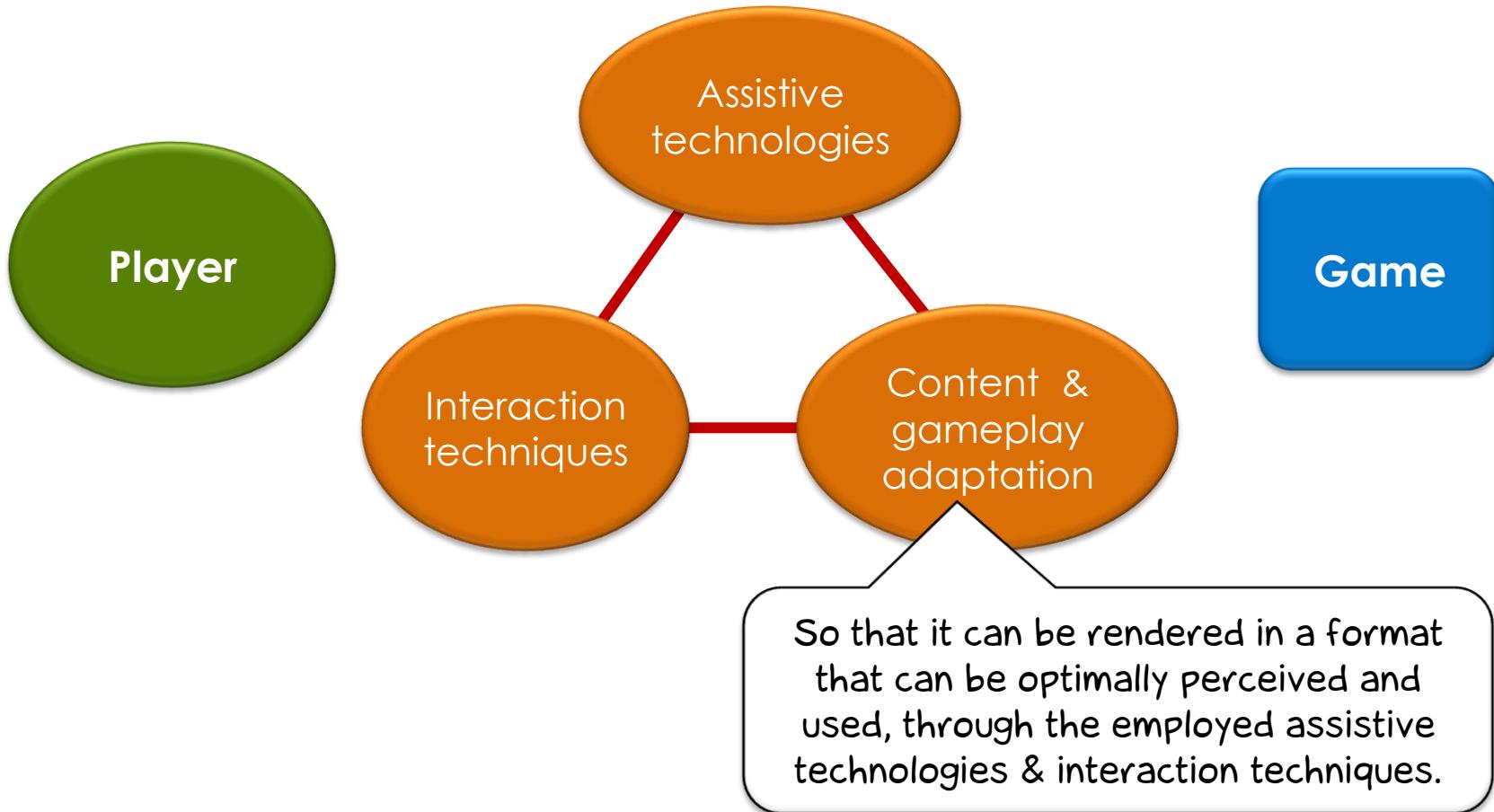
Overview of GA Solutions (2/5)



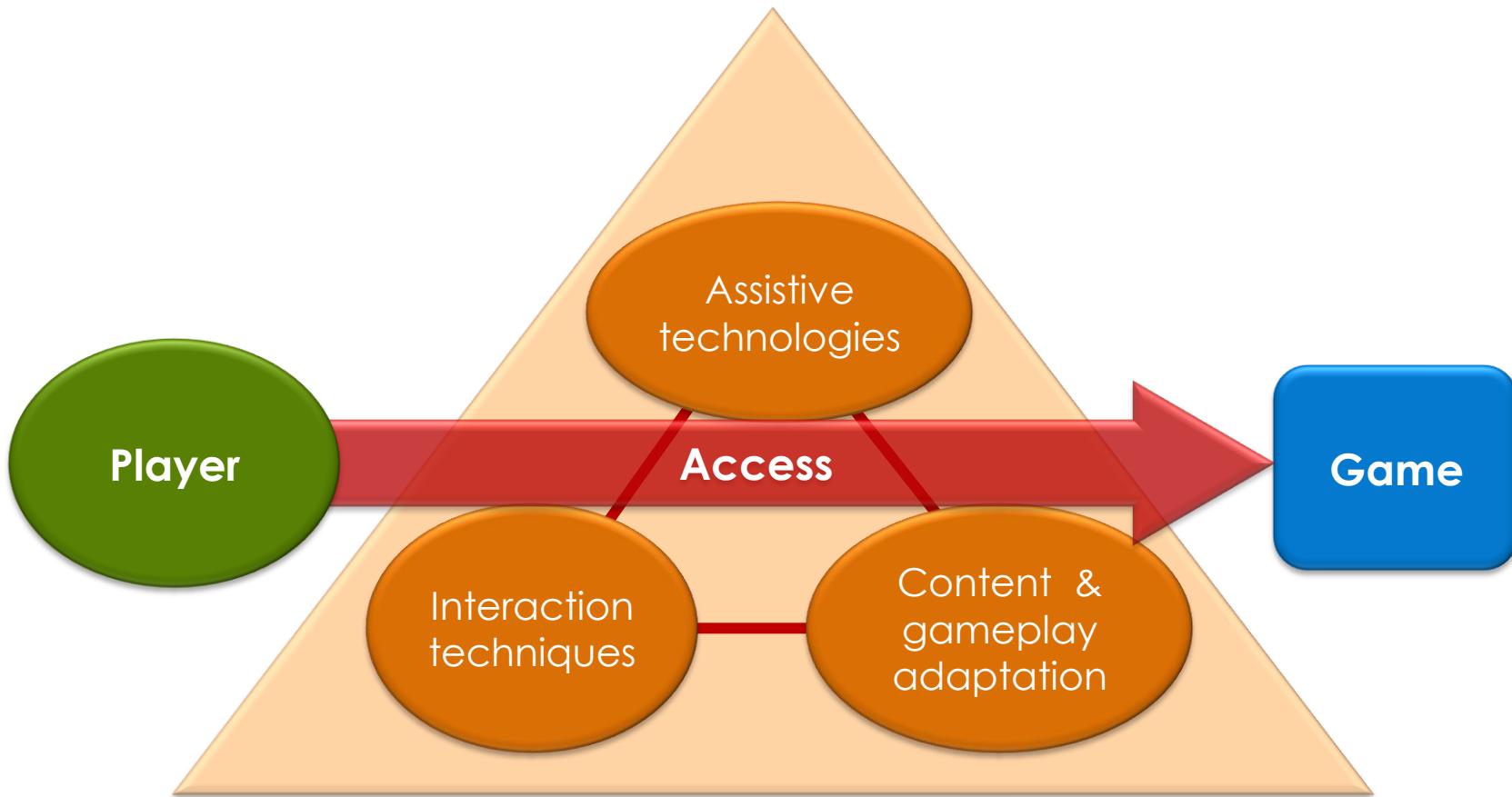
Overview of GA Solutions (3/5)



Overview of GA Solutions (4/5)



Overview of GA Solutions (5/5)



The right mix of these 3 ingredients can potentially solve any accessibility problem.



The good news...

- Although there are several different user categories and contexts of use, they share many similarities & requirements
 - ▶ a deaf person,
someone in a noisy place,
playing with muted sound
- Most of the time, when designing for GA, a single solution is likely to accommodate multiple problems & situations

A photograph of a man's torso and neck. He is wearing a dark suit jacket over a white shirt and a blue paisley tie. Several white sticky notes are pinned to his clothing: one to his tie with the handwritten text "REMEMBER TO REMEMBER!" and another to his pocket with "Reminder". A large, light-colored sticky note is held in front of him with the handwritten text "Don't Forget" and "MEMO".

Some things you can do (1/3)

- Support multiple input devices & techniques
- Customizable “controls”
 - ▶ Sensitivity
 - ▶ Less/simpler controls
 - Down to 1
 - ▶ No simultaneous button pressing
- Adjustable speed & difficulty
 - ▶ Automate user actions
 - e.g., shoot, move, pass

A photograph showing a close-up of a person's hands. They are wearing a dark grey suit jacket over a white shirt. Their right hand holds a blue pen and is writing in a light-colored, lined notebook. Their left hand rests on the notebook. The background is a plain, light-colored wall.

Some things you can do (2/3)

- Scalability of visuals
 - ▶ Text, game elements
- Alternative color schemes / contrast modes
- Adjustable visual detail
- Closed captions
 - ▶ Sound visualization
- Audio control
 - ▶ FX, music, speech (separately)



Some things you can do (3/3)

- Sonification
 - ▶ Audio feedback to events
 - ▶ Audio descriptions
 - ▶ Localised (2D/3D) audio
 - ▶ Reading aloud (text, menus)
- Accessible documentation

-
- ➡ Important note:
 - ▶ Make sure that the game is still playable & fun after selecting various combinations of the available GA options

A photograph of a young child with dark hair, wearing a white long-sleeved shirt under a red vest, smiling and holding a large, wrapped gift box with a red ribbon. The gift box has a silver bow and some text on it.

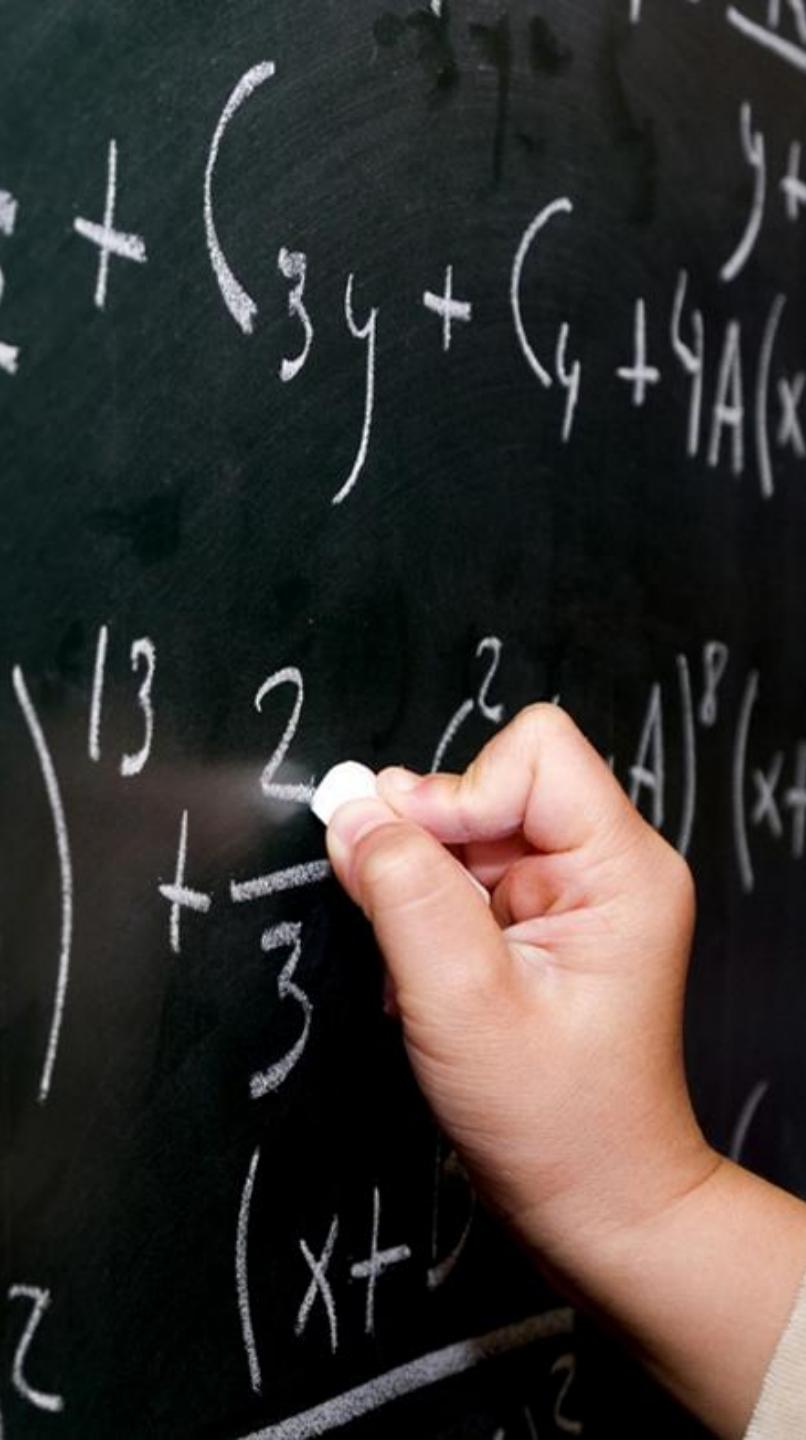
Indicative benefits for all players (1/2)

- Closed captions
 - ▶ Non(-native) language speakers, playing in loud / quiet environment
- Customizable “controls”
 - ▶ Left-handed / single-handed
- Alternative I/O devices
 - ▶ Playing using alternative input devices, such as a Touchpad, non-standard controller, etc.

A photograph of a young child with dark hair, wearing a white shirt and a red vest, smiling and holding a large, wrapped gift box. The gift is wrapped in white paper with a red ribbon and bow.

Indicative benefits for all players (2/2)

- Customizable “controls” & adjustable speed / difficulty
 - ▶ Novice / casual / tired / young / old player
- Scalability of visuals
 - ▶ Screen too small / very far
- Alternative color schemes / contrast modes
 - ▶ Playing in bright environment
- Sonification + simple controls
 - ▶ Playing on the move

A close-up photograph of a person's hand holding a piece of white chalk. The hand is positioned as if it is about to write or has just finished writing on a dark, reflective surface, likely a chalkboard. In the background, several mathematical equations are written in chalk, including terms like $3y$, $(4 + 4A)$, and $(x +$).

Remember...

Accessibility ≠ Usability

- ➡ A game may be accessible but still very hard (or boring) to play
 - ▶ e.g., using a virtual keyboard to play a game employing 18 keys – most of which must be simultaneously pressed

A photograph showing a close-up of a person's lower legs and feet. They are wearing light-colored trousers and bright green, waterproof boots. A red garden shovel stands upright in the ground next to their leg. The background is a soft-focus view of a green lawn and some bushes.

Some (harder) things you can do (1/2)

- Understand game accessibility & integrate it in the game design lifecycle
- Design your game at an abstract level first
- Create user interfaces that can support alternative interaction methods & modalities
 - ▶ that can co-exist & co-operate

A photograph of a woman with dark hair and a warm smile. She is wearing a blue ribbed sweater and a white measuring tape with red markings around her neck. Her hands are visible, one near her shoulder and another holding a piece of fabric. The background is slightly blurred, showing what appears to be a workshop or studio environment.

Some (harder) things you can do (2/2)

- Create user interfaces able to adapt to alternative user profiles
- Consult players from diverse user groups
- Follow open & extensible interaction design
 - ▶ so that, later on, it will be possible to expand the design to cater for more user categories & contexts of use

A close-up photograph of a young child's face. The child has dark skin and is wearing a white t-shirt. They are holding a large, light-colored wooden spoon in front of their face, partially obscuring it. The child is looking directly at the camera with a slight smile. A pink headband with a decorative bow is visible on their forehead.

Why should I do it, anyway? (egocentric view)

- a) You are different,
just like anybody else....
 - ▶ You can have games that match
your skills & preferences
- b) You are not getting any
younger
 - ▶ Age comes with GA problems
- c) Disability is not an exotic
disease
 - ▶ Permanent or temporary, can
happen to you, or the ones you
love, anytime, any day
 - ▶ You will still wanna play, right?

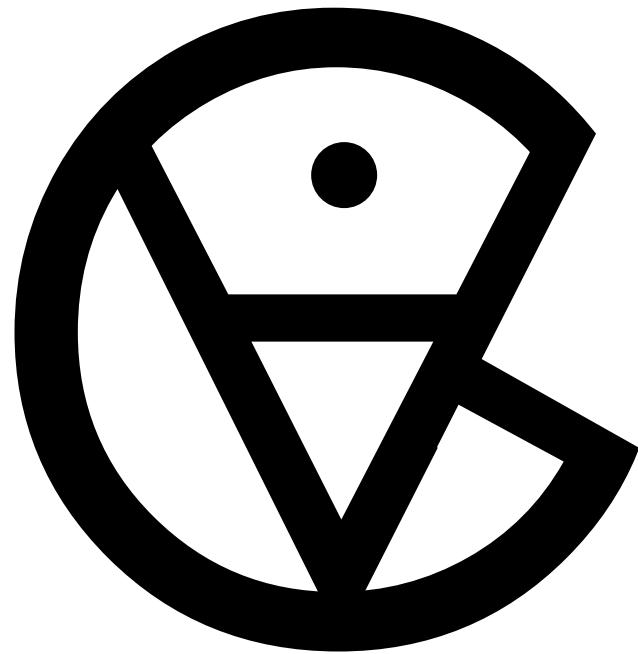


Why should I do it, anyway? (exocentric view)

- a) Your games will be better for ALL players
- b) You can broaden your target market = mak\$ (mor\$) mon\$y
- c) You can make a lot of people happier :-)
- d) Simply, because you can!

See also: Game Accessibility - Why Bother?
http://www.gamasutra.com/php-bin/news_index.php?story=13650





COME PLAY