GAT 315

3D Game Design I

Instructor

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Office Hours

- Tuesday 3pm-4:30pm
- Thursday 1pm-3pm

Sensation Engagement Type

- ❑ Sensation & Immersion
- ❑ Cosmetic Sensation
- ❑ Kinesthetic Sensation
- ❑ Excitation Sensation

SENSATION ENGAGEMENT TYPE

Sensation Engagement Type

Immersion in the stimulation of internal or external senses.

- Cosmetic
  o Visual, aural, smell, taste, beauty

- Kinesthetic
  o Motion, time, balance, force, touch, exertion

- Excitation
 o Thrill, risk-taking, anxiety, fear, pain, lust

Immersion

- Fundamentally, games that are delivering on Sensation must deliver on a sense of presence, or as we designers like to call it, immersion. In particular, it must deliver on spatial presence.

- So what elements lead to a sense of spatial presence? According to Werner Wirth and a team of other researchers, the first two primary steps are:
  - Creation of a Spatial Situation Model (representation of the space or world within the player's mind)
  - Hypothesis testing to establish primary ego reference frame (favoring the media-based space as "where they are")

Wirth, W., et al (2007). A Process Model for the Formation of Spatial Presence Experiences. *Media Psychology, 9*, 493-525.

Spatial Presence
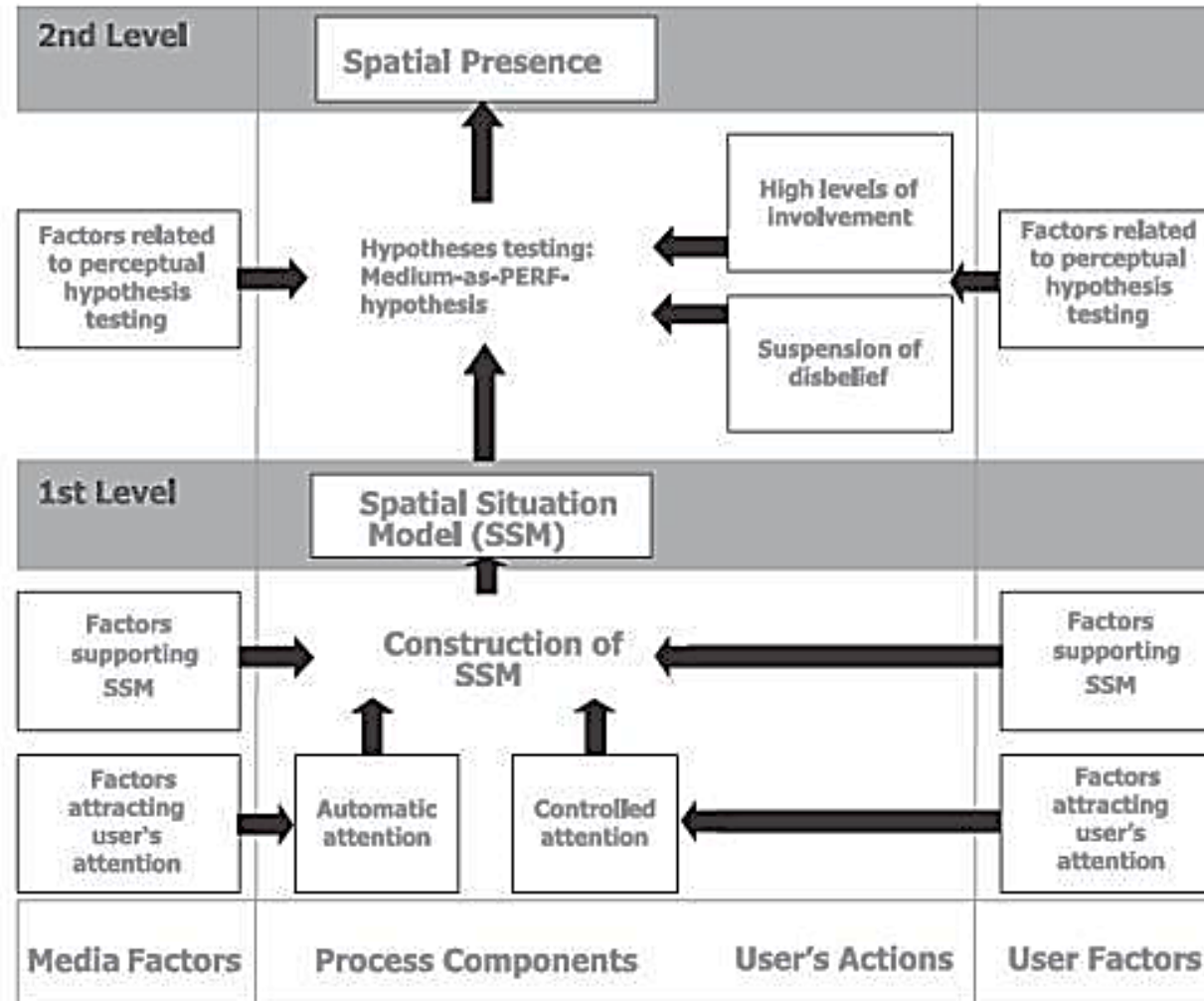
Wirth, W., et al (2007). A Process Model for the Formation of Spatial Presence Experiences. *Media Psychology, 9, 493-525.*

Characteristics of Spatial Presence

- Characteristics of games that facilitate sensory immersion can be grouped into two general categories:
    1. Richness of Mental Model
        - Multiple channels of sensory information
        - Completeness of sensory information
        - Cognitively demanding environments
    2. Consistency
        - Lack of incongruous sensory cues in the game world
        - Consistent behavior from things in the game world
        - An unbroken presentation of the game world
        - Interactivity with items in the game world

http://www.psychologyofgames.com/2010/07/the-psychology-of-immersion-in-video-games/

"Blown Away Guy" – Maxell Audio Cassette Ad

COSMETIC SENSATION

Cosmetic Sensation

- To deliver on cosmetic sensation, you generally need to focus on a particular sensation and focus every aspect of the experience on reinforcing that sensation through:
  - Engage multiple sensory channels
    - Deliver feedback through visuals, audio, effects, and even touch to reinforce and enhance the primary sensation through every channel of sensory information at your disposal
    - Make sure the sensory channels are congruous.
  - Amplify and focus
    - Overload the sensation feedback to drown out unimportant feedback.
    - Remove feedback that does not reinforce the sensation that you're trying to deliver.
  - Pacing
    - Avoid or minimize breaks from the sensory engagement type. Use differences in kind for interim breaks – these variations should also support the sensation.

fl0w

Rain

https://www.youtube.com/watch?v=qLIU_90P4Ac

Rez

https://www.youtube.com/watch?v=YZL4Cbt-knk

Other Games

- Peggle (end of level)
- Guitar Hero (visual and audio)
- Everyday Shooter
- Solace
- Etc.

- Lots of games use elements of Sensation…

KINESTHETIC SENSATION

Kinesthetic Sensation

- Kinesthetics is the study of body motion and the perception of motion, both conscious and unconscious.

- Proprioception is an extension of the sense of touch that detects body position, weight, and movement.

- To deliver on kinesthetic sensation, you must harness the mechanisms of your brain that integrate visual, auditory, and haptic stimuli to "trick" your sense of proprioception.

- The cerebellum is largely responsible for coordinating the unconscious aspects of proprioception.
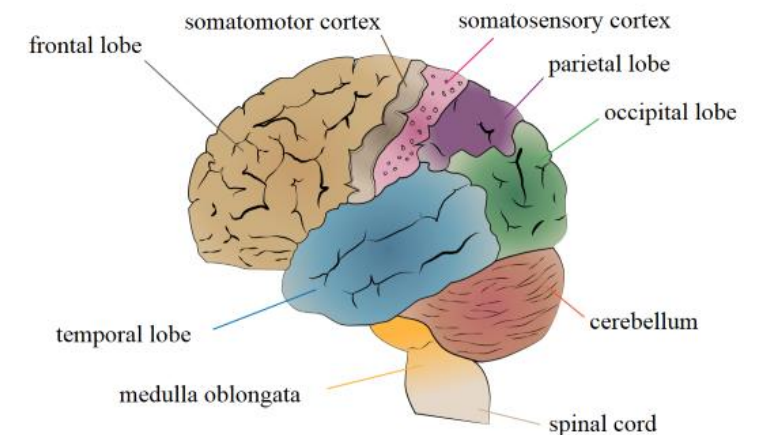
Proprioception and Vision

- Vision strongly affects our sense of our body in space.

- In 1999, Michael Graziano found that visual cues and proprioceptive cues about the position of the arm are encoded on to the same neurons in the premotor cortex of monkeys.

- Vision is involved with charting out the path and kinematics of our reaching movements, while proprioception turns this plan into action.

- Vision sometimes trumps proprioception when it comes to determining the positions and movements of body parts (phantom limb syndrome treatment).

http://www.pnas.org/content/96/18/10418.full
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3709263/
http://cercor.oxfordjournals.org/content/20/8/2007.full

Vection Illusions

- There are a number of different kinesthetic illusions of self-motion known as vection illusions that can potentially be harnessed:

    - **Circular Vection**
        - Observer is placed at the center of rotation of a large vertically-oriented rotating drum, usually painted with vertical stripes.
        - Observer feels like he is rotating and the drum is stationary.
    - **Linear Vection**
        - Observer views a field that either approaches or recedes.
        - Observer feels like he has moved forwards or backwards and the stimulus has stayed stationary.
    - **Roll Vection**
        - Observer views a patterned disk rotating around his or her line of sight.
        - Observer feels like he has rotated around the line of sight and the disk has stayed stationary.

- When a large part of the visual field moves, a viewer feels like he has moved and that the world is stationary.

- Inducing vection can also induce motion sickness in susceptible individuals.

Visual Cues

- Some visual techniques that you can use to create a sense of motion:
    - Camera Shake
        - If you're moving fast, there's usually quite a lot of vibration. Mimicking that helps sell the illusion of speed.
    - Field of View
        - As speed increases, widening the field of view (increasing the peripheral vision) appears to make you go faster because you see more things passing, and you lose detail on the items directly in front of you.
    - Depth of Field
        - You can accentuate this by changing the focal point for the player and applying a little bit of blur elsewhere. You can essentially say, "a competent driver would look here," and push the player's focus to that point, and change it as they brake or accelerate.
    - Vignetting
        - As you go faster, most people's ability to focus on things decreases, creating a form of tunnel vision. You can visually mimic this by closing off or blurring their peripheral vision to create that sense of claustrophobia.
    - Visual References
        - Regularly spaced landmarks (like lamp posts, signs, trees, dotted lines or transverse jointson a road, etc.) help convey a sense of speed as you zoom by. Motion parallax!

- Keep in mind, that forward motion is easier for most people to detect a sense of movement/speed than backwards motion (Bubka, et al 2008).

Audio Cues

- Some audio techniques that you can use to create a sense of motion:
  - Motion Rumble (+Camera Shake)
    - An appropriate audio rumble (based on how you're moving) can blend effectively with a camera shake.
  - Doppler Effect (+Visual References)
    - Place positional audio references in the environment and provide Doppler effect warping.
  - Audio Focusing (+Depth of Field or +Vignetting)
    - As the speed increases, slowly dropping the volume of items not directly ahead of you focuses the brain on those items.

Flower

https://www.youtube.com/watch?v=wBrwZci6Xps

Other Example Games

- Mirror's Edge
- Simulation games (Colin McRae Rally, Flight Sim)
- Solace
- DDR

EXCITATION SENSATION

Excitation Sensation

- Excitation sensation are experiences that drive thrill, risk-taking, anxiety, fear, pain, and in mature titles, lust.

- The primary motivations driving excitation games are Novelty and (inverse) Safety.

- A key part of driving excitation is building anticipation and tension. Some techniques include:

  - Limiting Information/Resources

    - Darkness and Reduced Visibility

    - Severe Resource Constraints (e.g. ammo)

    - Increased Danger (high stakes environment)

  - Time Dilation

    - Slow Motion (allow time to build anticipation)

    - Near Miss Exaggeration (dangling on the precipice)

  - Uncanny Valley

    - Not quite right, subverted expectations

Slender: The Eight Pages

https://www.youtube.com/watch?v=wBrwZci6Xps

Example Games

- Roller Coaster Simulator
- Any horror game

See You Next Class