Video Game Design

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Trespasser Case Study

Jurassic Park: Trespasser

- PC game, released 1998
- DreamWorks Interactive
- Produced by: Seamus Blackley
- FPS/Action
- Highly anticipated, but ultimately disappointing
  - Cutting edge physics (for the time)
  - Ambitious technology and game design choices hindered game

Trespasser Postmortem

- http://www.gamasutra.com/view/feature/131746/postmortem_dreamworks_.php
- "[T]hat [Game Developer] postmortem that didn't involve the team was not helpful. There was a lot of truth in it but also a lot of spite concealed as reporting. It's the only time I've ever really been genuinely suicidal now that I think about it. They should have done better." – **Seamus Blackley**

https://twitter.com/seamusblackley/status/1222559400360992769?s=11

DreamWorks

- Ambitious Mega-studio
- Entertainment Trifecta
  - Movies, Music, Video Games
- Founded by:
  - Steven Spielberg
  - Jeffrey Katzenberg (from Disney)
  - David Geffen
- Movie, Music and Video Game Divisions sold off

Seamus Blackley

- Physics expert
- Looking Glass Studios
  - Ultima Underworld
  - Flight Unlimited
  - System Shock
- Dreamworks
- Xbox Evangelist
- Creative Artists Agency Rep

Game Design Issues

- Idealistic approach to interface (no HUD)
- Unwilling to abandon this approach when it didn't work

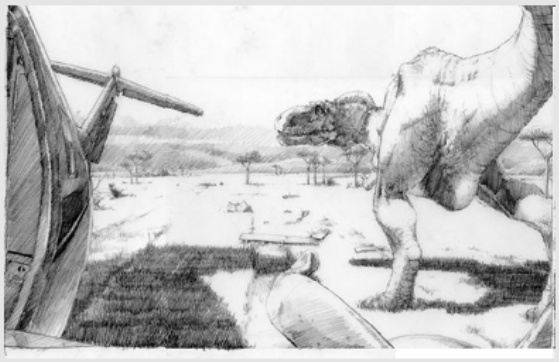
No HUD

- Tattoo life meter
- Character says how much ammo is left

"VR" Controls

- "Context-insensitive"
- Issues with physics engine and controls
  - "Realistic" and cumbersome inverse kinematic arm manipulation
    - Pick up, swing, throw
    - Holding gun out in front of body
      - No crosshairs
      - Guns have recoil
    - Can lift huge objects, but cannot pull up own body
    - Wrist rotates 360 degrees
    - No elbow

Trespasser Technology (and Problems)

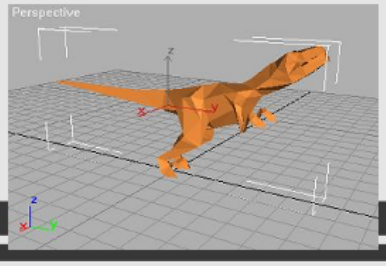


AI

- Broken AI
- State-based system
- AI problems resulted in dinosaurs with mood swings (oscillations between personality states)
- Advertised/promoted features disabled such as dino cooperation

Tools

- 3D Studio Max + plugins
- Various unanticipated technical limitations
- Felt that a custom level editor would have been worth the effort



Trespasser - Physics

- Bounding Box System – everything encased in a box (compound objects allowed)
- Penalty Force Method – intersecting objects push away until no longer intersecting
- Inverse Kinematics used to animate dinosaurs

Problems

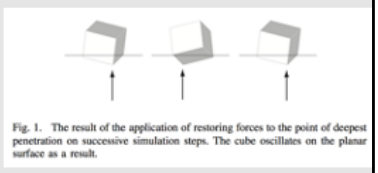


Fig. 1. The result of the application of restoring forces to the point of deepest penetration on successive simulation steps. The cube oscillates on the planar surface as a result.

- Poor friction modeling
- Interpenetration – Objects can become trapped within other objects
- Unstable – particularly when attempting to stack objects (esp. due to friction and interpenetration)
- Dinos moved strangely

http://www-robotics.usc.edu/~drumwrig/pubs/tvcg.pdf

Trespasser Physics - Sound

- Real-Time Foley Effects
- Database of sounds based on material properties of colliding items
- Select randomly from same class of sound for variety
- Physics engine used to determine volume attenuation of sound (larger object/higher velocity, louder collision sound)

Quote from **Postmortem: DreamWorks Interactive's *Trespasser*** (Game Developer June '99)

We had originally intended to have much more interesting physical challenges for the player consisting of making stacks and bridges to cross gaps or reach high places. Due to the problems with the physics engine, we ended up cutting nearly every puzzle which depended on this behavior, as it was too difficult and unreliable to actually make stacks. However, as it seems like such an obvious thing to do (and was so central to the design at one point), many players still try to make stacks, and come away from the game extremely frustrated. In different circumstances this constructive gameplay should be even more interesting than the purely destructive gameplay of knocking things over, and making it work ought to be one of the foremost goals of post-*Trespasser* physics engines.

Graphics

- Software-oriented Renderer
- 3dfx Voodoo (3D accelerator) became popular
- Bump mapping and image caching algorithms did not translate well to 3D hardware

Virtual Texturing

- Memory management based on texture usage
- Allowed artists to develop art independent of technical issues
- Very similar to John Carmack's Megatexturing!