Virtual Worlds

Lessons from the Bleeding Edge of Multiplayer Gaming

Greg Corson

Dave McCoy

What's This About?

- Dealing with bleeding-edge technology
- Multiplayer game design/development lessons learned.
- Tuning the game for maximum fun
- Strategies/tools for art and game development/debugging
- Working with complex multiprocessor computer systems
- Developing a ton of content
- Keeping artists and programmers from killing each other in the process.

Tutorial Background

- Covers development of Virtual World Entertainment's multiplayer games from 1990-1997
- Experiences from 4 distinctly different multi CPU hardware platforms
- 2 games, Battletech (giant robots) and Red Planet (high-speed racing).
- 8 or more players per game.
- Socially oriented gaming.
- Playable over the internet (in 1991)

Why is this info useful today?

- Dealing with Multiprocessors
  - Playstation II, 2 CPUs, 2 Vector Units, Image Processor, Programmable DMA
  - Xbox 1 CPU, 1 GPU
  - Virtual World, as many as 5 CPUS per cockpit
- Multiplayer over broadband
- Holding stable 3D frame rates
- Cinematic quality game replays.
- Shows how to build an on/off-line community around a simulation game

A quick timeline

- 1990 VWE system 1
  - sprite based 3d
  - 1 cpu (amiga)
  - custom sprite 3d transform engine. (TRW video engine)
- 1992 VWE system 2
  - flat shaded 3d
  - up to 16 dynamic, moving lights
  - 5 CPUs (68020, 68000, TI 34020, 34082)
- 1992 IDsoftware Wolfenstein 3D released
- 1993 VWE system 2.5 improved design
- Late 1993 IDsoftware DOOM released
- Early 1994 VWE system 3 new sound system

A quick timeline

- 1995 VWE "Tesla" system
  - 3 cpus with about 8meg RAM total (P90 class)
  - 1 "pixel planes" GPU
  - 4 channel sound (2 AWE-32 cards)
  - texture mapped graphics (< 1 meg texture RAM)
  - 7 screens
- 1996 ID software QUAKE released, full 3d
- Late 1997 ID software Quake II released
- 1997 First useful consumer PC 3d accelerators.

The Games-Battletech

- Giant Robot Combat
- Lasers, projectile and missile weapons
- Urban and open country maps
- Emphasis on team play

The Games-Red Planet

- Racing "mining vehicles" in Martian canals
- Demolition derby style combat at mach 1
- Imagine flying an F16…indoors.

Video Introduction

ALL PILOTS TRAVELING TO THE VIRTUAL WORLD™ DO SO AT THEIR OWN RISK.

VIRTUAL WORLD™ ASSUMES NO LIABILITY FOR PRE-EXISTING CONDITIONS WHICH MAY BE AGGRAVATED BY INTERDIMENSIONAL TRAVEL.

WHILE WE CANNOT GUARANTEE YOUR SAFETY, WE ARE PROUD OF THE LOW FATALITY RATE AMONG OUR PILOTS.

YOUR SAFETY IS [OUR] PRIMARY CONCERN!
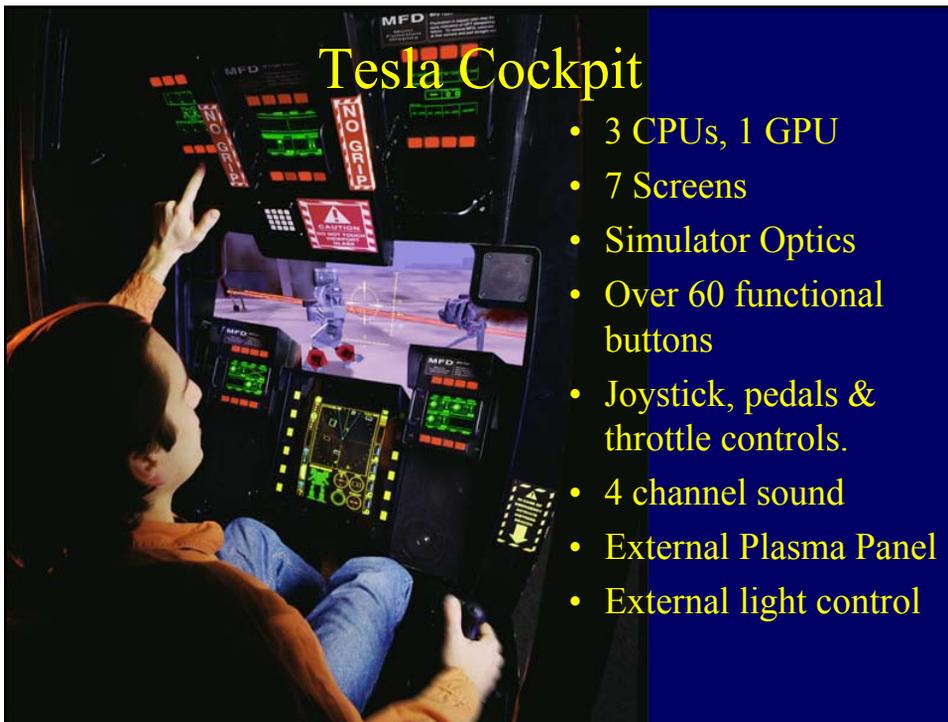
Tesla Cockpit

- 3 CPUs, 1 GPU
- 7 Screens
- Simulator Optics
- Over 60 functional buttons
- Joystick, pedals & throttle controls.
- 4 channel sound
- External Plasma Panel
- External light control

Briefing Area

- Players come here 10 minutes before game.
- Beginners watch a training video
- Advanced players plan the mission, choose teams, vehicles…etc.

- A PC and videodisk player.
- Area heavily themed with vehicle blueprints, course maps…etc.

Mission Review

- Players get a 10 minute replay of the game with "wide world of sports" production values
- Used virtual "cameras" on the playing field and on vehicles like the NASCAR "bumper cam".
- Printed a record of the game
- Gave players a chance to cool down after a game and interact with the other players face to face
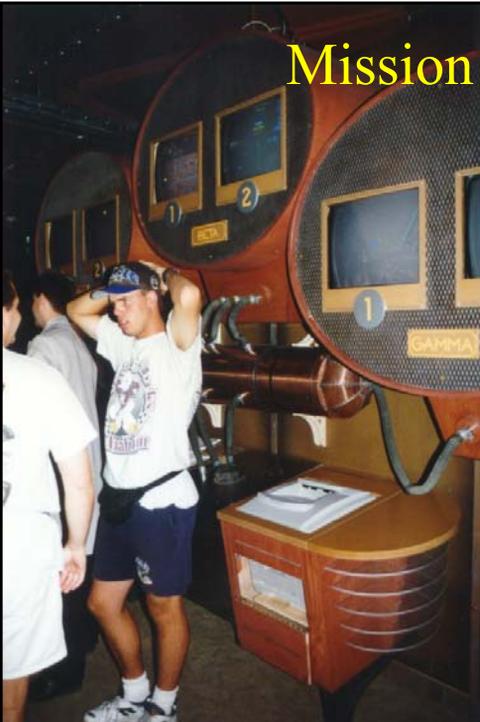
A Small Site
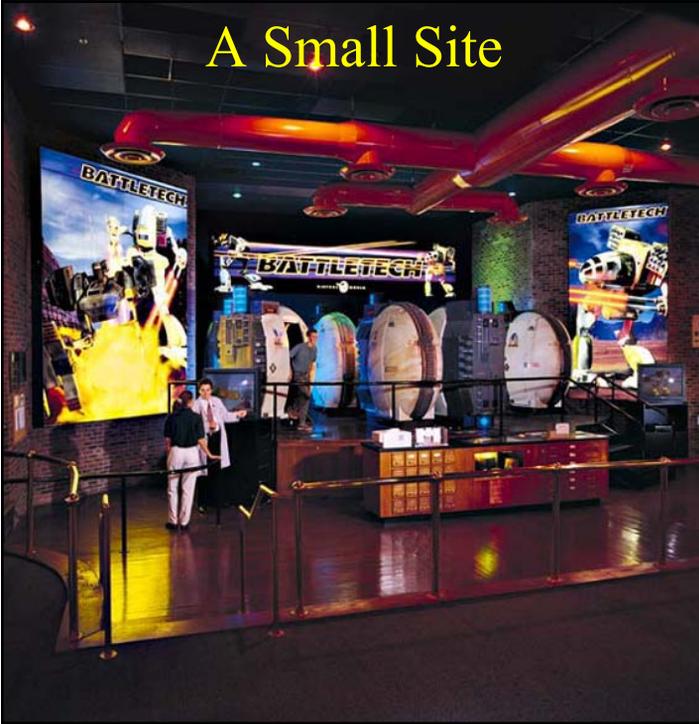
- 8 cockpits
- Operators console
- Briefing Station
- Reservation Station
- Mission Review
- Scoresheet Printer
- 28 CPUs total

Larger Sites Were Also Made

- 32 cockpits, usually used in groups of 8
- 3 reservation computers
- 4 operators console computers
- 4 briefing stations with videodisk players
- 8 mission review computers
- 20 monitors, computerized video switcher
- 2 laser printers, 3 ticket printers
- ISDN and video-phone link to other sites
- Internet and local information kiosk's
- Over 130 CPUs and 40 GPUs in the system

Reservation Counter

Lounge Area

Library

Merchandise Sales

Internet Information Kiosk
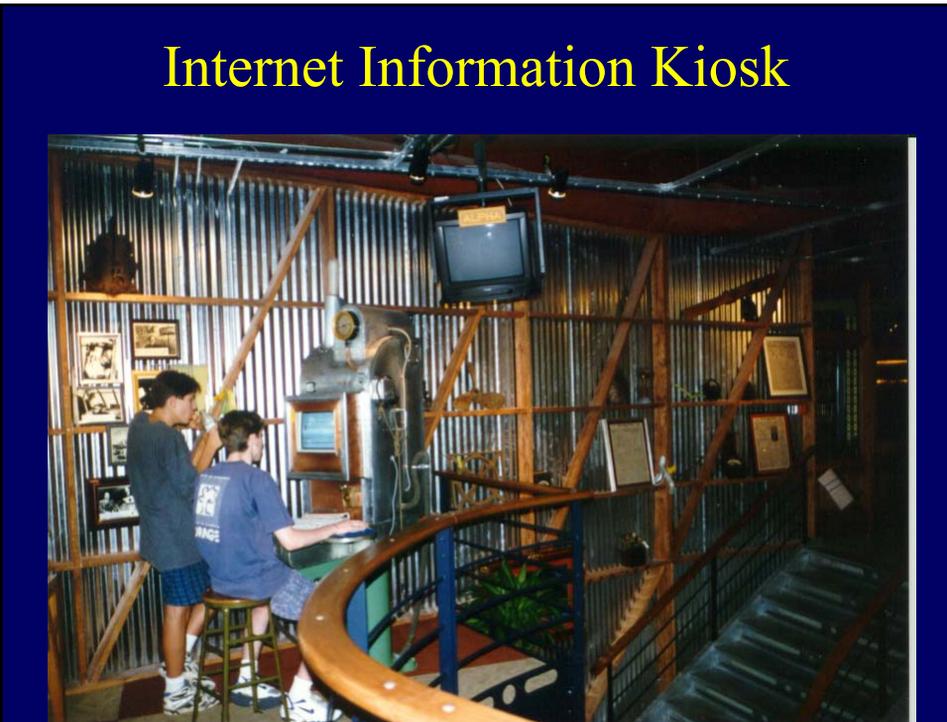
A very complicated project!

- Lots of content (software, art, live action video and physical props/themeing)
- Many interactions between CPUs to debug
- Game design can't overwhelm new users, but must challenge veterans to keep them coming back
- Handicapping players is essential if all the people in the game are to have fun.
- System must run continuously for 16 hours a day with no breaks between games and no crashes on ANY processor.

Again, Why is this useful today?

- All these elements (lobby, reservations, briefing, mission review, merchandise sales) can be integrated into a modern on-line game and will increase revenues.
- All the design and social lessons learned are just as valid for current on-line games
- The design challenges of this system are similar those of modern PC's and consoles

Who is Greg Corson?

- Actively working in computer industry since 1974
- Writing multiplayer/network games since 1975
- Experience in Radio/TV production
- Computer based (book) publishing experience
- Freelance computer consulting/troubleshooting
- Factory automation (steel mills, assembly lines)
- Data Networking & telecommunications
- Product design/development/review
- Game designer

Who is Greg Corson?

- Wrote multiplayer games and chat software on the PLATO system in the late '70s.
- Developed 3D multiplayer games for GEnie in the mid 1980's and wrote/operated "The Connection" multiplayer BBS system.
- 1990-1997 Chief Software Engineer of Virtual World Entertainment
- 1997-1999 NEC Electronics PowerVR dev support, evangelism and project management including Sega Dreamcast
- 1999-now Sony Playstation R&D lab.

Who Is Dave McCoy

- Working in computer graphics field since 1981
- CGI Animation for video
- Pre-press CGI work for publication
- Wrote assembly code for CGI toys
- Patent for film compositing technique using CGI
- Co-Founder Video/Film Graphic Production Company *Atlantic Digital Image* 1988

Who Is Dave McCoy

- 1991-1996 Art Director then Creative Director for Virtual World Entertainment
- Co-signed patent for texture projection technique
- 1996-1999 Creative Director for FASA Interactive
- Co-Creator *Crimson Skies*
- 1999-2000 Creative Director for Microsoft Games Intellectual Properties Group
- 2000-now Graphics Techniques Consultant for Xbox Advanced Technology Group

Tutorial Schedule

The class runs from 10:00 am to 6:00 pm
We will stop and start on time for the breaks.
- Intro, what is Virtual world?
- Game Design
- Art and Content
- Programming and Software Design
- Last Words

Break Schedule

11:00-11:15 Morning break
12:30-2:00 Lunch
4:00-4:15 Afternoon break

Questions???

- If you need something we are talking about clarified, feel free to put your hand up and we'll try to get to you quickly.
- If you have general questions, please hold them till we get to the end of a topic or till we call for them.
- Please give us a moment to grab our snacks and lunch at the beginning of the breaks, then we'll come back here and answer your questions for the rest of the break.

Contact Information

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