

Georgia Institute of Technology

ASE 6003: Modeling & Simulation for Systems Engineering



Module 12: Games and Virtual Worlds

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Modelbenders LLC

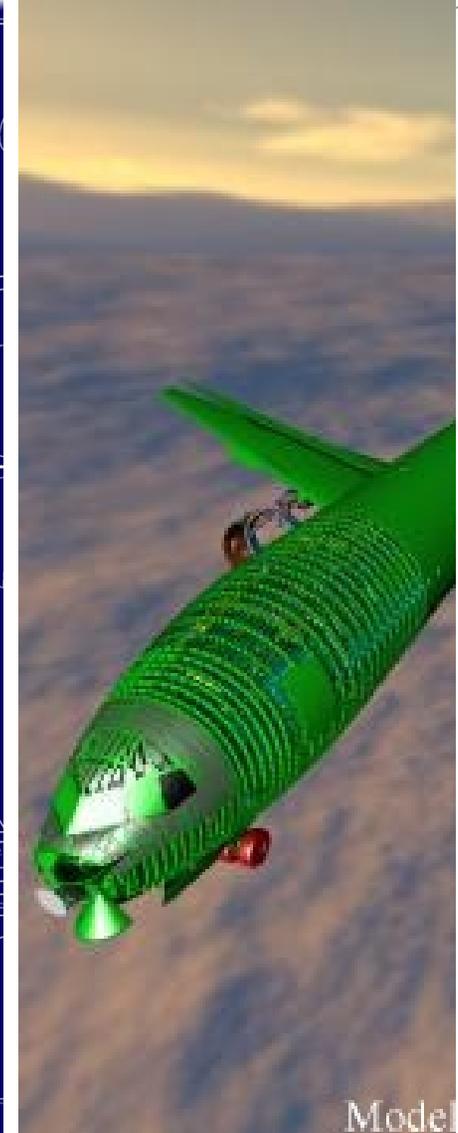
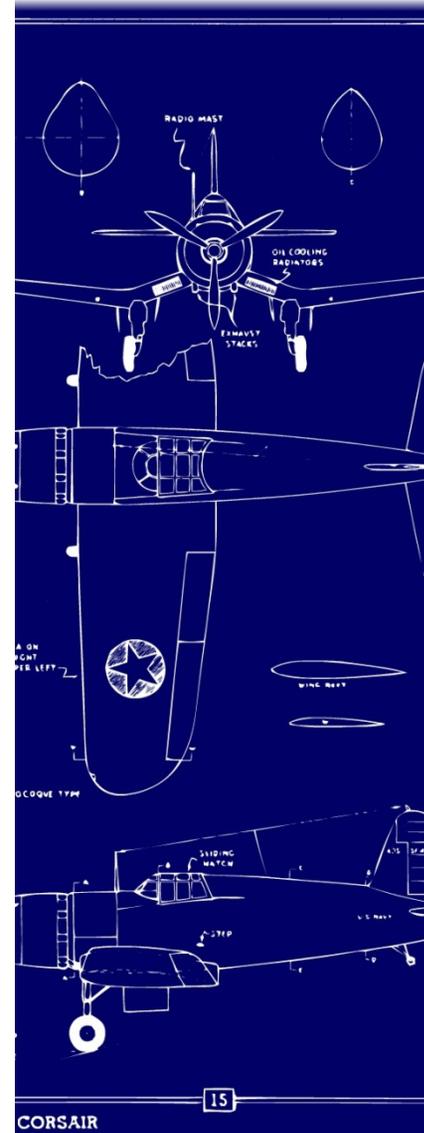
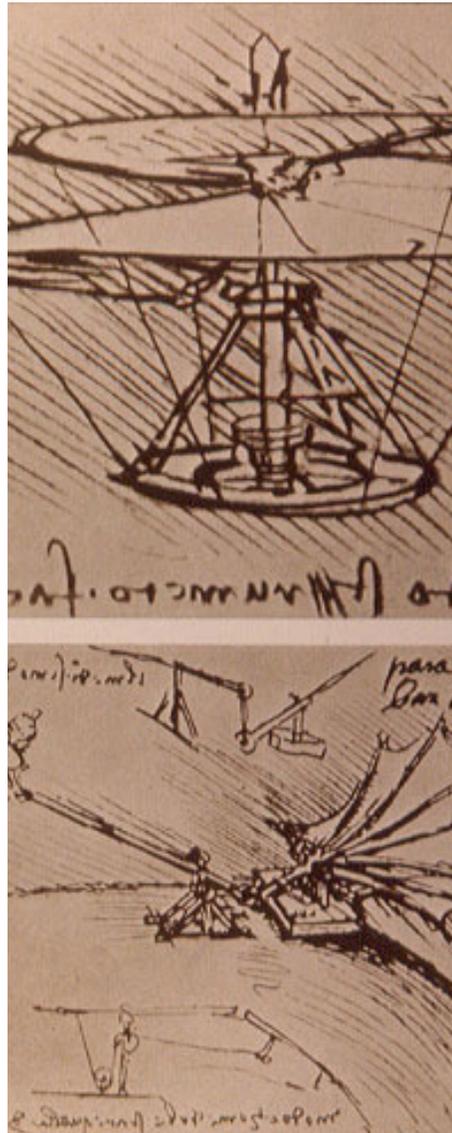
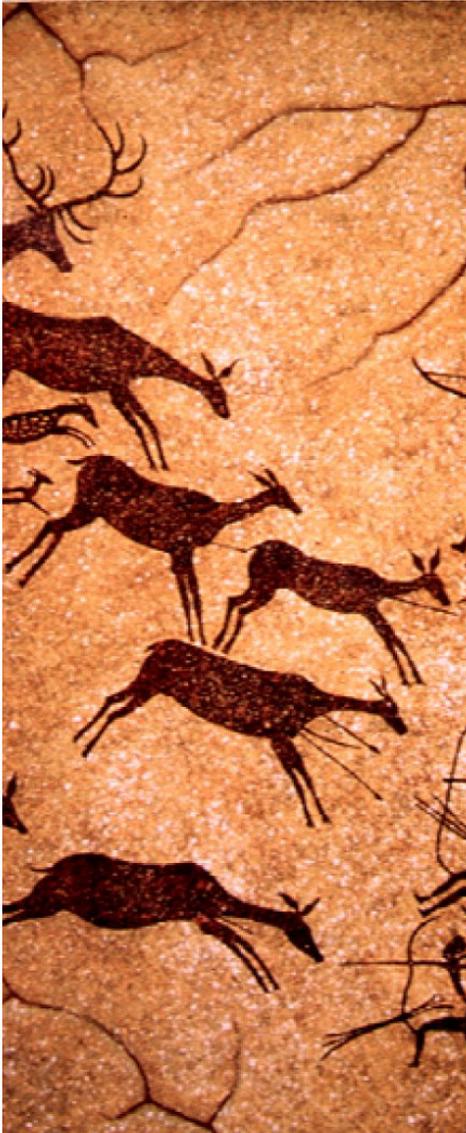
<http://www.modelbenders.com>



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Engineering Tools are Generational



Digital information in its primitive form

```
GET /asp30/05/header_refresh.asp
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Sat, 01 Jul 2000 21:09:53 GMT
Refresh: 3
Connection: Keep-Alive
Content-Length: 79
Content-Type: text/html
Set-Cookie: ASPSESSIONIDQQGGGYZC=KGGLDLCDDAOELPOLCDJD
Cache-control: private

<b>Response.AddHeader "Refresh", "3" </b><HR color=CC
7/1/2000 5:09:53 PM

Connection to host lost.

Press any key to continue...
```

TELNET

```
lsrv opening HSC11 mode data connection for /bin/ls.
226 Transfer complete.
- 544 2003-02-04 16:29 2426 AssemblyInfo.cs
- 744 2003-02-05 13:17 3381 FtpAsyncResult.cs
- 544 2003-02-04 16:29 4093 FtpControl.cs
- 544 2003-02-04 16:29 2949 FtpData.cs
- 544 2003-02-04 16:29 4891 FtpEvents.cs
- 544 2003-02-04 16:29 7840 FtpException.cs
- 744 2003-02-05 18:51 84613 FtpMain.cs
- 744 2003-02-05 18:51 4960 FtpMisc.cs
- 744 2003-02-05 14:41 4776 FtpParse.cs
- 544 2003-02-04 16:29 10343 FtpProxy.cs
- 744 2003-02-05 15:12 11369 FtpStream.cs
- 744 2003-02-05 19:07 7680 FtpTest.exe
- 544 2003-02-04 16:29 19077 FtpWebRequest.cs
- 544 2003-02-04 16:29 3613 Item.cs
- 544 2003-02-04 16:29 7821 List.cs
- 544 2003-02-04 16:29 10170 ListParse.cs
- 544 2003-02-04 16:29 8573 ProxySocket.cs
- 544 2003-02-04 16:29 3257 Socks4.cs
- 544 2003-02-04 16:29 6338 Socks5.cs
- 744 2003-02-05 19:13 65024 rbxFtpLibrary.dll
ftp> chmod 755 rbxFtpLibrary.dll
200 CHMOD command successful.
ftp> pwd
257 "/home/lukasp/RebexFtp" is current directory.
ftp> disconnect
Disconnecting...
221-You have transferred 0 bytes in 0 files.
221-Total traffic for this session was 20770 bytes in 13 transfers.
221-Thank you for using the FTP service on karma.
```

FTP

```
Mailbox is '/var/mail/root' with 2 messages

1 Sep 17 Patrick J. Volkerd (174) Welcome to Linux (Slackware 5
0 2 Sep 17 (45) Register with the Linux count

You can use any of the following commands by pressing the first charac
d)delete or u)ndelete mail, m)ail a message, r)eply or f)orward mail,
To read a message, press <return>. j = move down, k = move up, ? = I

Command:
```

E-MAIL

```
West of House 0/0

ZORK I: The Great Underground Empire
Infocom interactive fiction - a fantasy
story
Copyright (c) 1981, 1982, 1983, 1984,
1985, 1986 Infocom, Inc.
All rights reserved.
ZORK is a registered trademark of
Infocom, Inc.
Release 52 / Serial number 871125 /
Interpreter 8 Version J

West of House
You are standing in an open field west
of a white house, with a boarded front
door.
There is a small mailbox here.

>_
```

ZORK

Digital information in its visual form



Computer “Killer Apps”

Spreadsheet

ITEM	QUANTITY	UNIT PRICE	TOTAL COST
MUCK RAKE	43	12.95	556.85
BUZZ CUT	15	6.75	101.25
TOE TONER	250	49.95	12487.50
EYE SNUFF	2	4.95	9.90
SUBTOTAL			13155.50
9.75% TAX			1282.66

Word Processor

H:INTRO PAGE 1 LTI

--Cursor Movement--
 ^S char left ^D char right
 ^A word left ^F word right
 ^E line up ^X line down

--Scrolling--
 ^Z line down ^W line up
 ^C screen up ^R screen down

1. Introducing WordStar

WordStar is highly flexible and very visible. Watch the screens as you give commands, and information in various parts of the screen will guide you. You won't see all the information all the time, but it will be there when you need

menus are your greatest aids. They are at the top of your screen, showing you where

SET RM 5UNDLIN 6BLDFCE 7BEGBLK 8ENDBLK 9BEGFIL 10ENDFIL

3D Game Engine

50 AMMO 0% HEALTH 2 3 4 ARMS 0% ARMOR 50 200 50 300

E-Mail

PINE 3.87 COMPOSE MESSAGE

To : jsmith@mhpc.edu
 Cc :
 Attchmt :
 Subject :
 ----- Message Text -----

Rich Hdr
 Attach

Del Line Postpone
 UnDel Line To AddrBk

Web Browser

Hotlist Annotate Help

msaic Home Page

nca.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html

SAIC
 Microsoft Windows • Macintosh

saic, an Internet information browser and World Wide Web client. NCSA developed at the National Center for Supercomputing Applications at the University of Illinois in Urbana-Champaign. NCSA Mosaic software is copyrighted by the University of Illinois (UI), and ownership remains with the University of Illinois.

Jan '97

The Software Development Group at the University of Illinois has developed and we've learned a lot in the process. We are pleased to share this technology to the masses and we hope you will help us receive it in return. However, the resources in other areas of interest are still being developed.

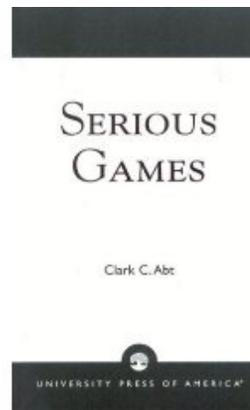
All information about the Mosaic software is available at the NCSA Mosaic Platform.

1970 Serious Games Definition

“Reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives.

“We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement.”

Abt, C. (1970). *Serious Games*. New York: The Viking Press.



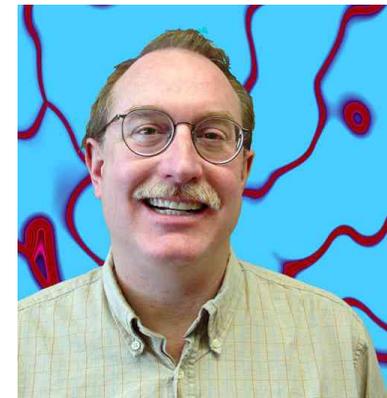
2005 Serious Games Definition

Game: “a physical or mental contest, played according to specific rules, with the goal of amusing or rewarding the participant.”

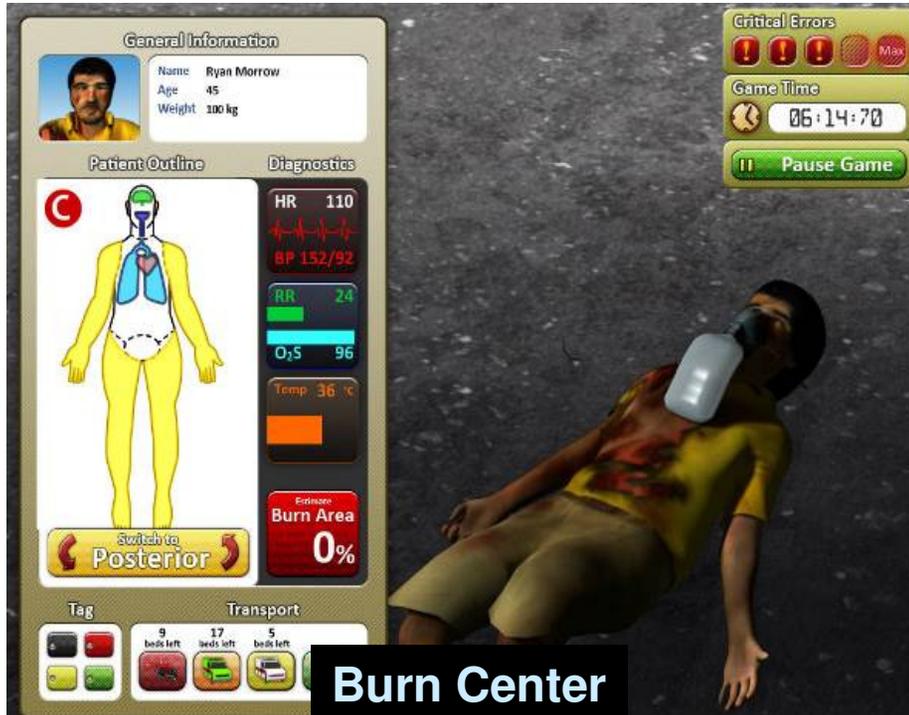
Video Game: “a mental contest, played with a computer according to certain rules for amusement, recreation, or winning a stake.”

Serious Game: “a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives.”

Zyda, M. (September 2005). “From visual simulation to virtual reality to games”.
IEEE Computer.



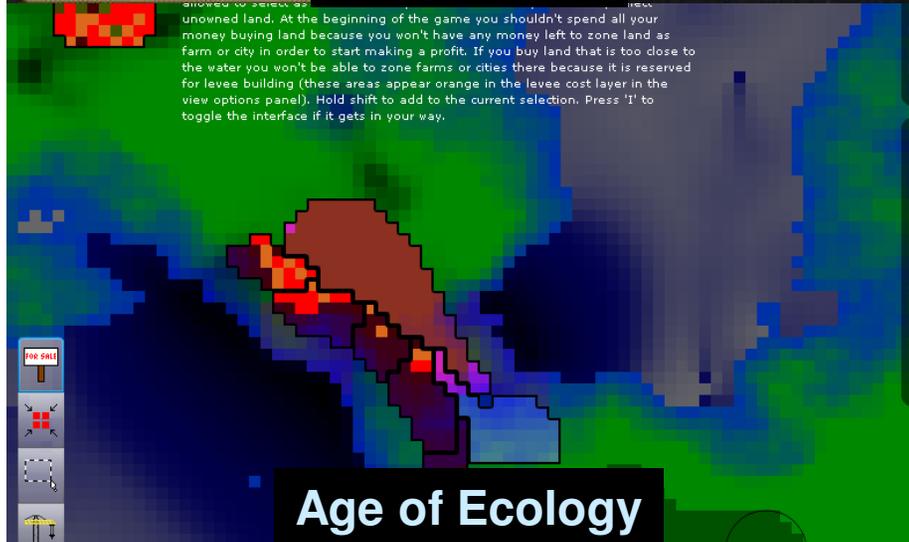
Serious Games Examples



Burn Center



Direct Action



Age of Ecology



Geo Commander

Industries Adopting Serious Games



Military



Medicine



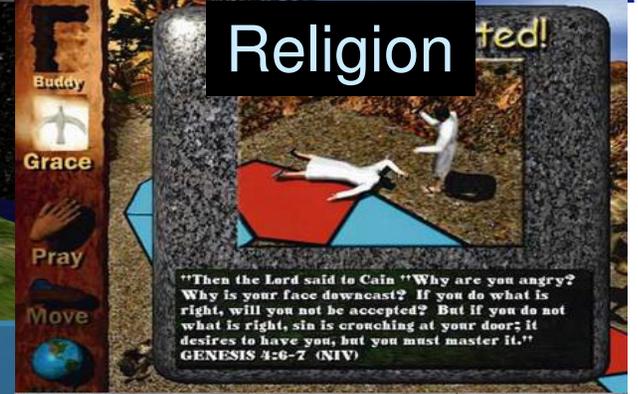
Emergency Mgt



City Plan



Engineering



Religion



Space Explore



Machinima



Politics

Military Serious Games

Full Spectrum Warrior



America Army



VBS2



Tactical Iraqi



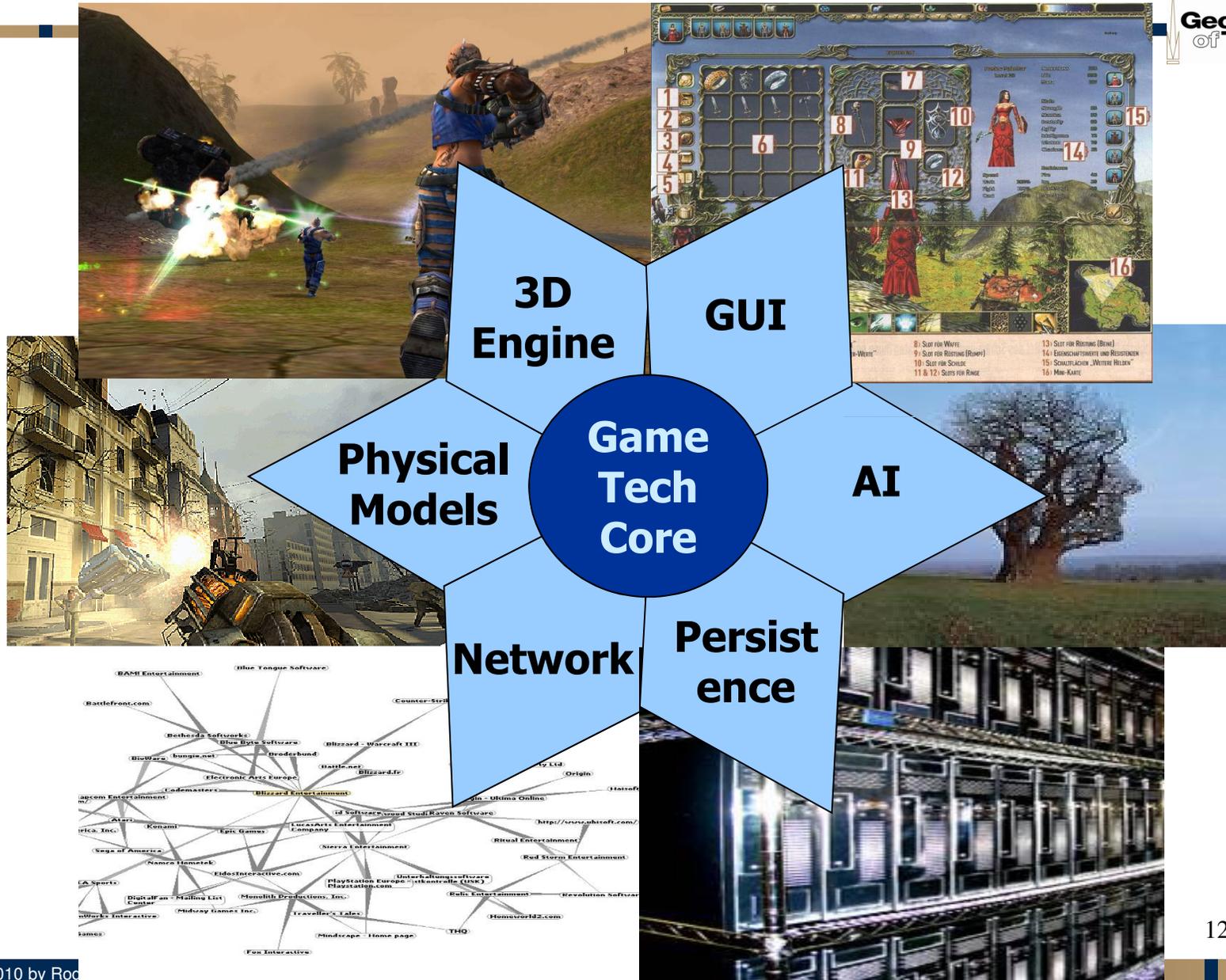
TC3



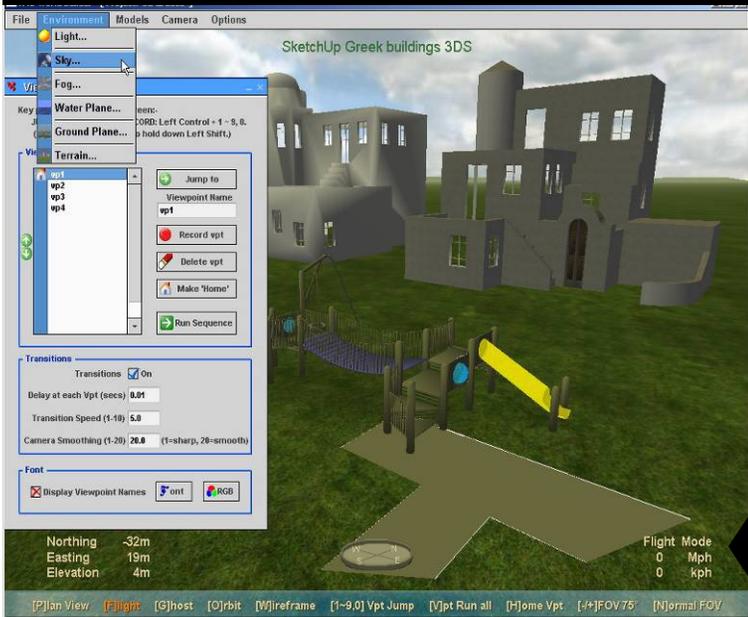
Tactical Questioning



Game Technologies

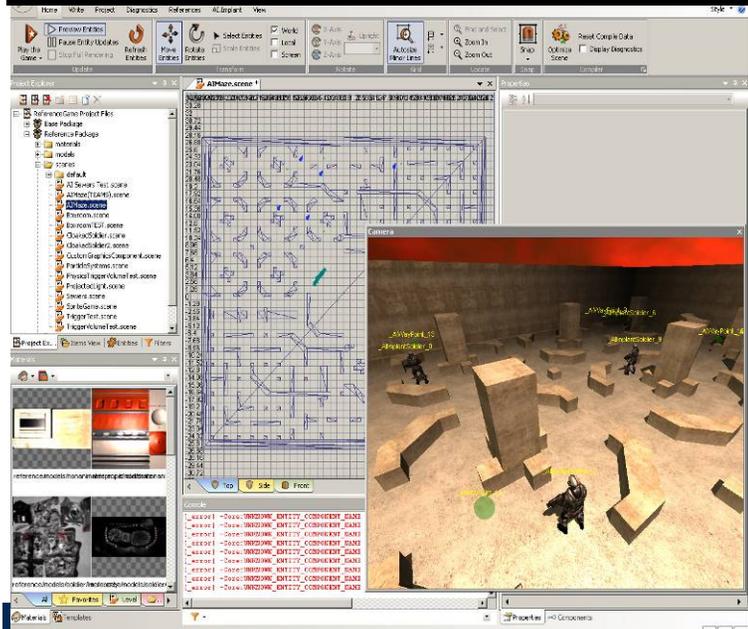


World Building Tools



Pre-Game

Behavior Scripting

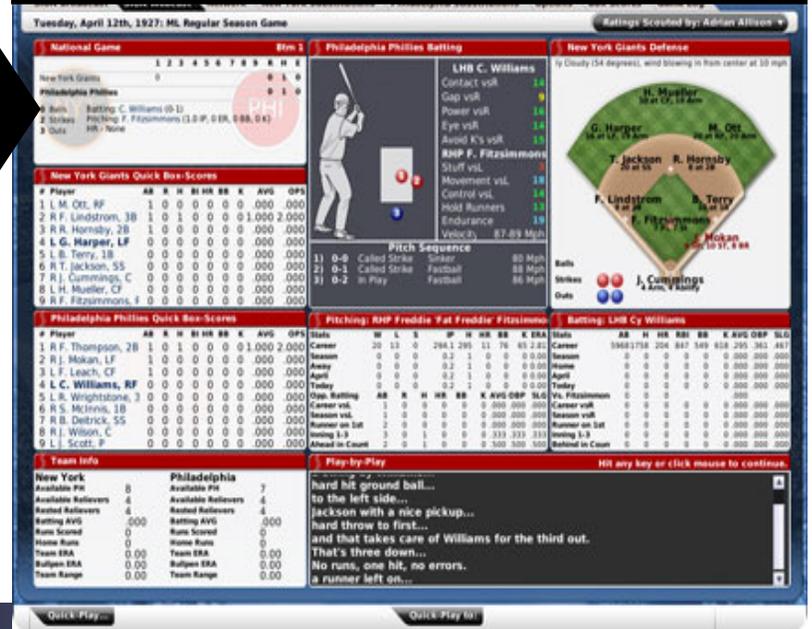


Post-Game

Game Recording



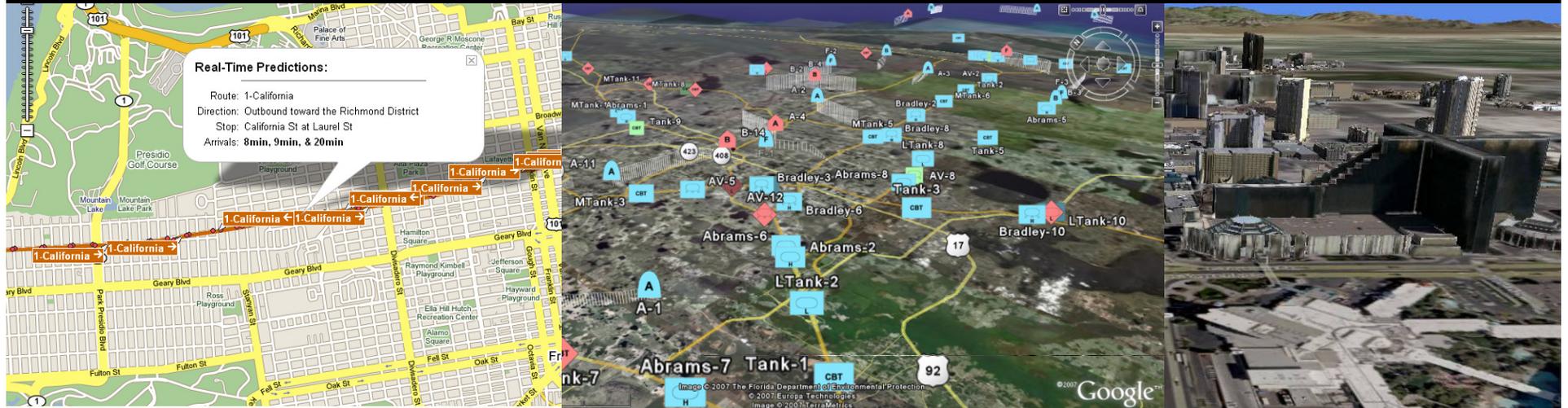
Player & Team Stats



Games Organize & Animate Data

Organize

Place objects and features into spatial context.



Animate

Enable dynamics with cause-and-effect.



Create a Sense of ...

PLACE

Map, Google Earth, Game Levels, Virtual Worlds



PERSON

Second Life, Virtual World Avatars



PURPOSE

Missions, Quests, Puzzles, Objectives



3D Shooters ... Right Here, Right Now.

Focus has been on very short time periods and very small virtual spaces.



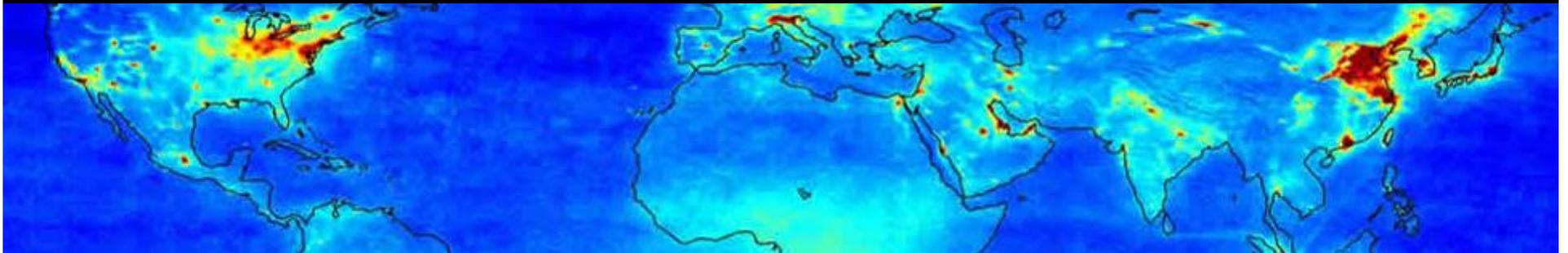
MMOGs ... Connect Past, Present, and Future.

Make other places and other times relevant to each other.



Virtual Worlds ... Create Context, Connections, and History.

A digital world that is big enough to handle important issues.



VW Perspective & Evolution



VW Product Focus

Primary VW Capabilities

3D Exploration

Graphical Beauty

User Created Content

Self Expression

Social Networking



These capabilities attract and satisfy a small user base.
These are not the kinds of capabilities that business
people want and need.



Digital User Needs

Information	Collection and display of daily data feeds. News feeds and Blogs.
Office	Reading, Creating, and Managing office documents.
Maps	Viewing and Navigating maps and geographic data.
Social	Maintaining and Using Social Networks.
Entertainment	Delivering Entertainment. Movies and Music.
Games	Interactive, Immersive Entertainment.
Virtual Worlds	Representing and Integrating Large World Data Sets.

Interoperable Virtual Worlds

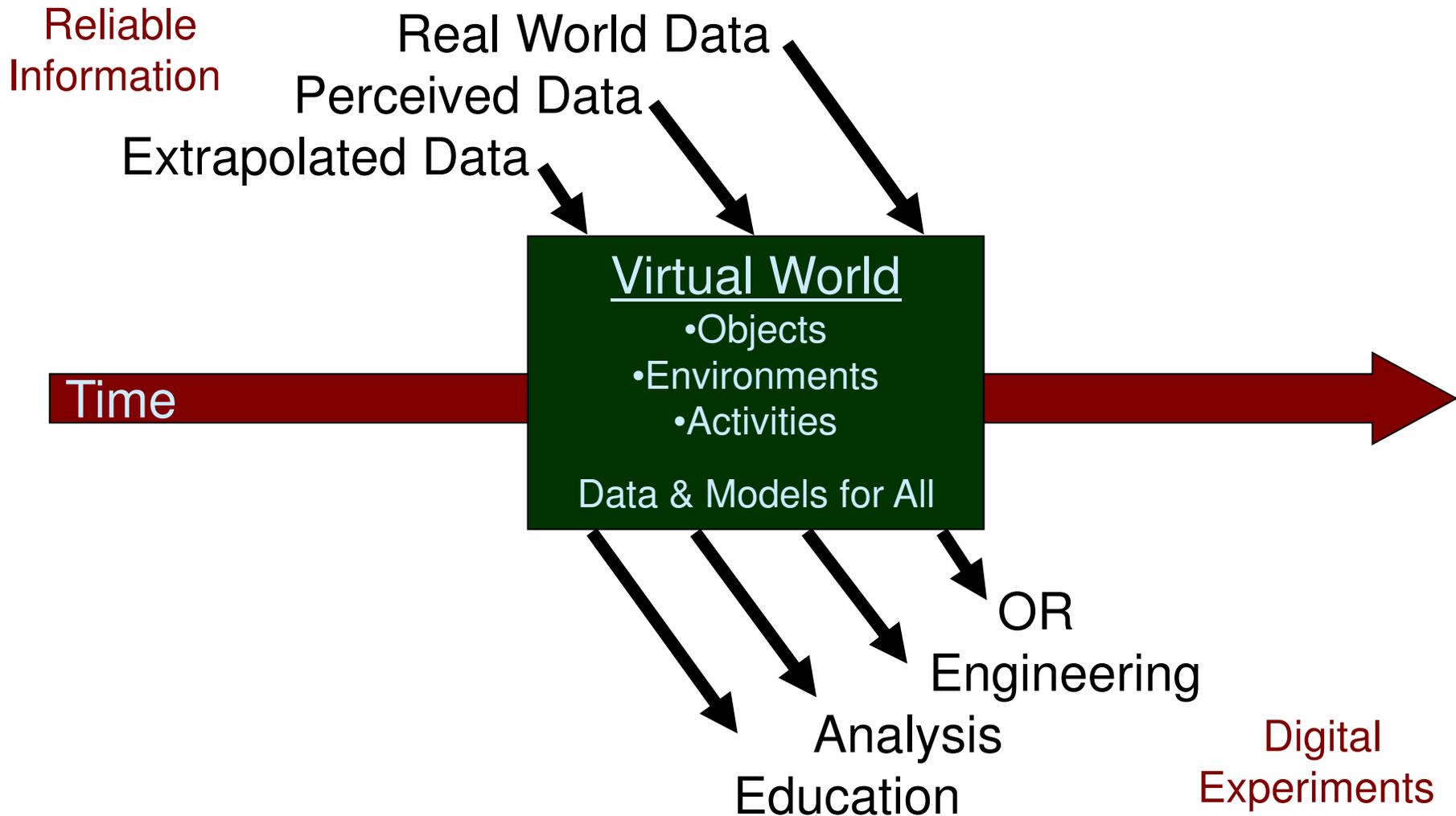


Games create models appropriate for the purpose and environment. Simulations try to use one model for every object. Unique from data values.

Virtual Worlds need many heterogeneous models with an infrastructure that can enable them to work together. Similar to work that has been done on Agent standards.



Real-time Real-world Data Integration



Virtual World Data & Models

Data – Consistent, Integrated, Dynamic

About terrain, vegetation, cityscape, building interiors



Models – Heterogeneous, User Supplied, Modifiable

Of object behavior, communication networks, human behavior, group dynamics



Needed: Standards for the data, models, and infrastructure in the Virtual World

Scope of the Virtual World



Personal	Digital Buddy	Family	Group	Company	City	World
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Corporate	CEO	Leadership Team	Department	Competitor	Industry	Market
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Defense	Commander	Staff	Unit	Army	Battlefield	Theater
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Intelligence	President	Cabinet	Government	Populous	Country	Alliance
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Conclusion



Games are an expression of new technologies which can be applied in hundreds of ways.

We will leverage this technology in the same way we have leveraged previous technologies for education, engineering, business, and the arts.

