# Memento Mundi: Are Virtual Worlds history?

Henry Lowood Stanford University Libraries iPres 2009, 5 Oct. 2009



5 Oct 2009



Earth and Beyond (Electronic Arts, 2002-2004)

## Closed Worlds

- PLATO games (late 1970s), e.g. Oubliette, Avatar
- Aradath/Dragon's Gate (Gamer's World, Genie, AOL, 1984-2007)
- Habitat (LucasArts, 1986-1988)
- Meridian 59 (3DO, 1995-2000) revived 2002 by Near Death Studios, 2002
- Phantasy Star Online, Dreamcast version (Sega, 2000-2007)
- Motor City Online (EA, 2001-2003)
- Earth and Beyond (EA, 2002-2004)
- EA-Land/The Sims Online (EA, 2002-2008)
- Tabula Rasa (2009)
- Hellgate: London (soon)
- ... and many more

# Virtual Worlds are History

- Many virtual worlds have already disappeared
- Servers shut down
- Software lost
- Data lost
- Communities dispersed



5 Oct 2009

## Virtual Worlds: Presence



# Who Killed Miss Norway?

"In March of this year, some of those friends started to notice that they hadn't seen Karyn in a while. You know how it goes in the online world--people don't leave, they just fail to show up, usually, and you never know what happened to them. But in this case there was her website to go to. So people went looking for Karyn.

A day later the news filtered out across the bulletin boards, via emails, and eventually onto the welcome message when you first logged in: Karyn was dead. She had died in a head-on collision while test-driving a new car. And it had happened two months before, in January, and none of us had known.

Her parents knew that she had friends on the Internet--they didn't quite understand what she did online, or who those friends were, but they knew that there were people out there somewhere who might want to learn the news. It took them some time to find her webpage, and to learn how to put a message up. But they did it, and they attached news items about the car crash, in Norwegian."

-- Raph Koster, "A Story about a Tree" (May 1998)



Tracy Spaight, "Who Killed Miss Norway? Salon.com (14 April 2003)

# Your virtual world just closed. What will be the first thing about it (or in it) that you will miss?

# Virtual Worlds are History

- Historically specific activities take place in virtual worlds
- Without documentation of events, communities, and activities, the history of virtual worlds is lost when worlds are lost.
- Historical documentation is a matter of archival curation, not software preservation alone.

### Deathswitch

#### BRIDGING MORTALITY



Information Insurance

Already a member? Lug n

### What is a deathswitch?

Imagine that you die with computer passwords in your head, leaving coworkers without access to critical files. Imagine your loved ones cannot find your bank accounts, or that you die with a secret that you longed to reveal during your lifetime. A **deathswitch** is an automated system that prompts you for your password on a regular schedule to make sure you are still alive. When you do not enter your password for some period of time, the system prompts you again several times. With no reply, the computer deduces you are dead or critically disabled, and your pre-scripted messages are automatically emailed to those named by you.

#### Services Overview

We are the only company to offer a deathswitch subscription service (patent pending). You create email messages, attach files, and specify your recipients, and the messages are automatically emailed after your switch is triggered. With the free account, you get 1 recipient and no attachments. With the premium account, you get 30 messages, up to 10 recipients each, and the ability to attach files such as videos, pictures and documents. We keep the information secure until you stop responding, and then we send it.

#### Information Insurance

A deathswitch is information insurance. Don't die with secrets that need to be free.



Sepyright (c) Deathswitch, 2006-2008. Privacy Policy

## Perfect Capture



### NoSkill Memorial Site

April 22, 1978 - Dec. 26, 2001

[chunkk] ladies and gentlemen..its as simple as this... noskill is doomgod..and im right after him



Chris "NoSkill" Crosby and his son, Jacob \*

#### Who was NoSkill?

NoSkill was one of the earliest, high-skilled Doom2 Deathmatch players. He was known as the original "Doomgod" and was active around 1994-1996 (demos I have span May, 1995 through April, 1996). At the time he was best known for his Doom2 Map11, Map7 and Map1 games, and reportedly liked Map3. He played modem-to-modem doom, primarily.

Why is this a "memorial" site?

Noskill died in an unfortunate 1-car accident that occurred on December 25, 2001. He was a passenger in a car on a ramp leading from northbound I-65 to northbound I-

Update: 4/23/02 : Mynx emailed with some additional information that we did not have before. It turns out that Chris was actually wearing his seatbelt at the time of the accident (we were told before that he was not). However, the driver of the car, his friend David, was not. The new information as it was emailed yesterday by his wife, Nicole Crosby, reads as follows:

>Chris was wearing his seatbelt. David was not. David was partially ejected >>and landed with his rear end on Chris's head/side, his head and chest out >>the back of the 2 door car.

>>Chris died on impact basically from being shook so hard his brain couldn't >>handle it. David survived and didn't get completely ejected because he >>landed on Chris.

How do you know it was him, for sure?

📑 😜 Internet

(a) \$100% •

#### How do you know it was him, for sure?

The accident was described on the website of a local newspaper, <u>The Indianapolis Star</u>, and a long-time acquaintance of NoSkill named <u>Mynx</u> has verified both his name and the description of his family as it appears in the obituary. The newspaper's sites referring to the accident and the obituary are no longer available on the website due to their age, but screenshots of the websites have been preserved locally, and can be viewed here: <u>accidentatif</u> and <u>obituary.gif</u>.

#### Why was NoSkill special to Doom2?

He was among the first players to develop a sophisticated Map1 game.

He was among the group of players that first developed a highly-skilled Map11 game.

He was, to our knowledge, the first player to be referred to as "Doomgod". This was originally a singular term, referring to the one highest-skilled active player. The term has changed over the years to permit multiple Doomgods.

Thorough analysis of his Doom2 recordings shows that he used an extremely uncommon keyboard and mouse configuration known as "Mouse+Keys Assist". It had no official differentiation from normal "Mouse+Keys" until recently. The difference can be summarized this way: He used the mouse primarily for movement, and the keyboard as a comparatively minor aid. This config requires extremely high mouse sensitivity to be used skillfully. Detailed technical information about Mouse+Keys Assist configurations will probably be written about soon.

Are there any NoSkill recordings around?

These are all of the recordings available on Doom2.net to date.

Players and download	Dates	Map
<u>NoSkill vs. "Meg"</u>	May 21, 1995	Doom2 Map11
<u>NoSkill vs. Avatar</u>	May 27, 1995	Doom2 Map 1
NoSkill vs. Stoney	June 3, 1995	Doom2 Map 7
NoSkill vs. EvilGenius	August 10, 1995	Doom2 Map 1
NoSkill vs. "Sil"	September 16, 1995	Doom2 Map 3
NoSkill vs. Smight	October 15, 1995	Doom2 Map 1
<u>NoSkill vs.</u> <u>TrueChamp</u>	December 29, 1995	Doom2 Map 1
<u>NoSkill vs.</u> <u>Arcademan #2</u>	March 31, 1996	Doom2 Map 1
<u>NoSkill vs.</u> Arcademan #3	April 3, 1996	Doom2 Map 3
NoSkill vs. Hawk	around April 4, 1996	Doom2 Map 1

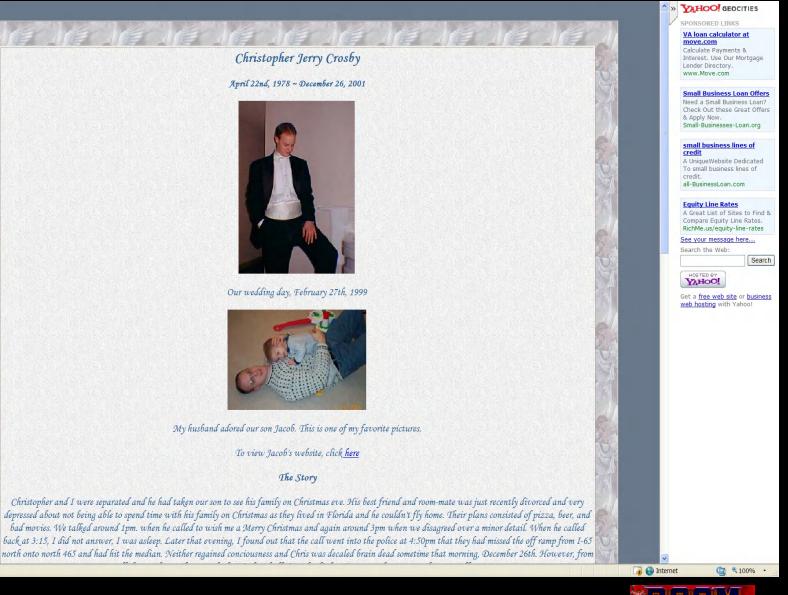
A zipfile containing all of the above demos can be downloaded here.

If you have material you would like to submit for use (pictures, unpublished demos, information, whatever), you are welcome to send it to bahdko@erols.com .

(a) \$100% •

词 🚷 Internet







Done

## Perfect Loss



"Now I am become death, the destroyer of worlds" – EA-Land shuts down, 31 July 2008 <sup>5 Oct 2009</sup>



Anti-Front National protests in Second Life, Jan. 2007 source: Wagner James Au, New World Notes blog

#### **RPG Lore Network Sites:**

#### EQ - EQ II - DAoC - MTG - AC - AC II - AO - SWG - SB - PS

Site Menu

Quick Links Skills Items Magic Classes/Races Geography Bestiary Quests

#### Everlore

**Remove Ads** Main Page **News Archives** Submit News News Letters Email News Polls Introduction Search Site Register Your Info Guild/Player **Your Messages** Login / Logoff **IRC Live Chat** Add Wizard Contact Us

#### Community

MOST RECENT! Search Forums Forum Rules General Forums Main Hall Server Specific Class Specific Trade Skills Epic Quests Off-Topic

#### Game Info MOST RECENT! Items Quests

Bestiary Geography Magic/Spells Player Guides

#### PoD Zeres | 9/12/2001 2:42:11 PM

Here we gathered around another of Norrath's famous citizens, also joining us in raising a torch.



[Add Comments] Please add your comments here! [Add Screenshot] Submit your own screenshot!

Order by Date: [Asc] [Desc] Order by Rating: [Asc] [Desc] Currently: Descending by Date

✓ Submited by: Skincade the Malevol On: 9/15/2001 9:46:27
Rank: worst 1 2 3 4 5 6 7 8 9 10
AM

Great thing you guys have going. I lead my guild, being the guild leader = P, on a walk from Freeport, through EC, into Nek, Lava, all through Najena, then back and to Sol B. The guild is made up of all IvI 56+ characters except one 53 and one person's 49 alt. MANY were suprised that a bunch of high IvI players would be doing this instead of "camping phat I33tz", but we were all very hurt by this incident, as we lost a friend that was touring the WTC. My condolences and hats off to you all for your good deeds. Oh and to the "smart one" below, someone gave the PoD the torch, no gm took him over.....

Skincade The Malevolent Grave Lord of the 60th Harvest -Leader of- ~Immortal Brood of Tarew Marr~ Tarew Marr Server

Everquest, 12 Sept. 2001, reported on Everlore forum (defunct)

5 Oct 2009

### Vigil held on Tunare in Memory Zeres Thex [9/13/2001-11:04:44 AM] Comments[5]

Last Tuesday, after the days horrific events, there was a vigil held in the Greater Faydarks on the Tuanre Server.

About 20-30 of us as well as 4 guide layed down our arms and lifted torches in memory of thos lost. We then had a moment of silence in their honor (there was actually a full minute in GFay with no shouts or ooc's, and only 2 auctions).

We then marched from the Felwithe Gates where we met to the bank of Kelethin. There, we held a toast with the fine spirits provided by the guides. After the ceremony, we all gave our torches to merchants and other NPS's in kelethin, so the memory of those lost may live on.

If you are on the Tunare server, log on and you will still see them holding there torches high in honor of those who lost their lives.

Screenshot #1 Screenshot #2 Screenshot #3 Screenshot #4 Screenshot #5 Screenshot #6 Screenshot #7 Screenshot #8

### Everlore forum, 12 Sept. 2001

I think the one thing that \*isn't\* in the proprietary data is the history of unusual or defining episodes or events in the life of particular virtual worlds . . . The narrative history, the event history, of any given virtual world, may in fact be obscured by the kinds of god's-eye view data that developers have. After all, they often don't know what is happening at the subjective level of experience within communities, or have to react to it after it's happened. (Say, when players stage a protest.)

- Timothy Burke, "The History of Virtual Worlds," Terranova blog post and discussion thread.



Asheron's Call, Thistledown server, Nov. 2000 – Protecting the Shard of the Herald (above) Shard Vigil Memorial (right)



## Events



*Everquest:* The killing of The Sleeper (15 Nov. 2003) -- screenshot taken by members of participating guilds

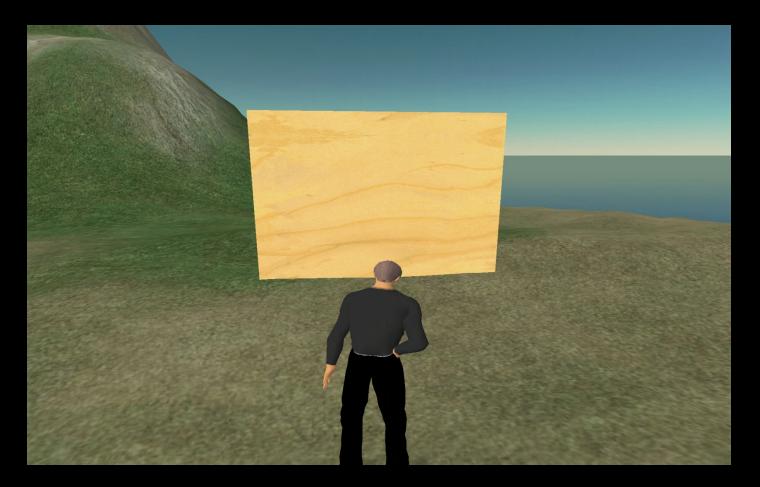
5 Oct 2009



Strange Company, "Ozymandias" (2001)



World of Warcraft – what's happening here? When? Why? Answer: Serenity Now attacks Fayejin's funeral procession (4 March 2006) *Source: Archiving Virtual Worlds Collection* 



Anybody home?



#### Home > Blogs > Matteo Bittanti's blog

9 September, 2009 - 14:35 - Matteo Bittanti

#### Navigation

#### Archives

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- Archiving Virtual Worlds
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- Blogs
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- 🛡 Past Projects
  - Past Projects
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  - E-Sports and Cyberathleticism Workshop
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  - Student Essays (New Interface)
  - Articles on Websites
- Interesting Links
- Wiki

#### Editors

Moderate Comments

### Matteo Bittanti: Experiments in Game Art: c'était un rendez-vous numerique (2009), ObamAds (2009) and james ballard plays burnout (2009).

Game Art, Game History, Game Shows by HTGG

Nicholas Wener: "All Your History Are Belong To Us", a new game show that examines the history of specific game franchises, in this case, *Halo.* 

Stay tuned for more!

Matteo Bittanti's blog Add new comment

How They Got Game is powered by

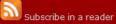


### Search this site: Search

#### **HTGG Links**

- Henry Lowood
- Henrik Bennetsen
- Matteo Bittanti
- Nicholas Werner
- TL Taylor
- Tim Lenoir
- Casev Alt
- Archiving Virtual Worlds
- Virtual Worlds Timeline
- Digital Game Canon
- Machinima Archive
- Preserving Virtual Worlds
- Free Pixel

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#### Cabrinety Collection Twitter Feed posted: 01:49 PM 09/19/2009 New post on Avalon Hill Computer Games up at: http://bit.ly/jAxnc Enjoy! posted: 12:40 PM 06/30/2009 Wood like to know what this keyboard is for http://mobypicture.com/?5c0q64







5 Oct 2009

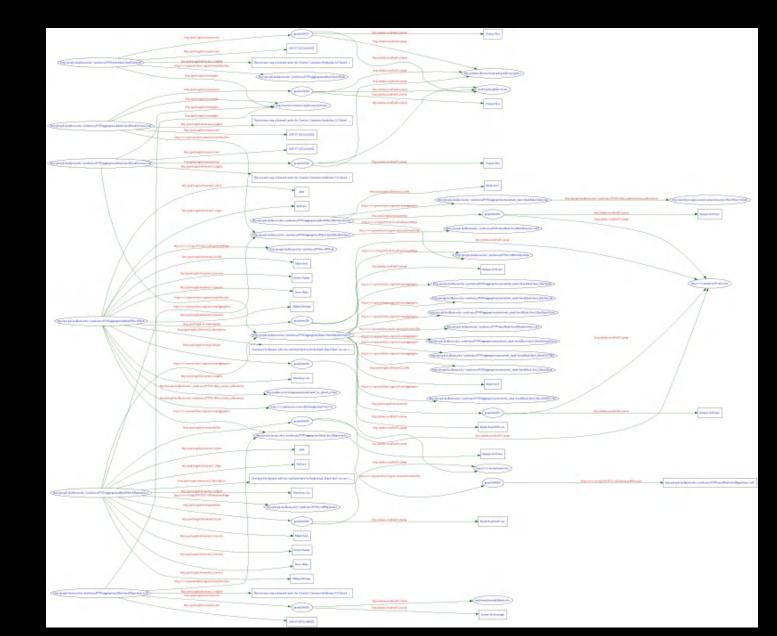
# Preserving Virtual Worlds Project Goals

Develop mechanisms and methods to preserve digital games and interactive fiction by

- Investigating preservation issues through a series of case studies;
- Developing basic standards for metadata and content representation;
- Archiving key representative content; and
- Building community awareness of issues.



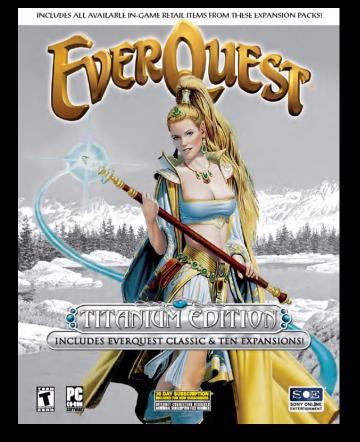




Mindwheel, RDF metadata, by Jerome McDonough, PVW project

5 Oct 2009

# What are we preserving?

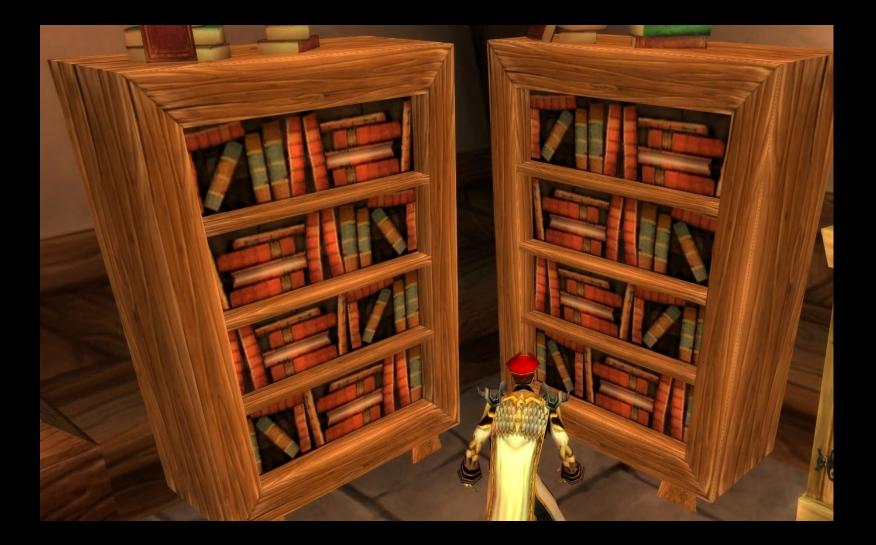






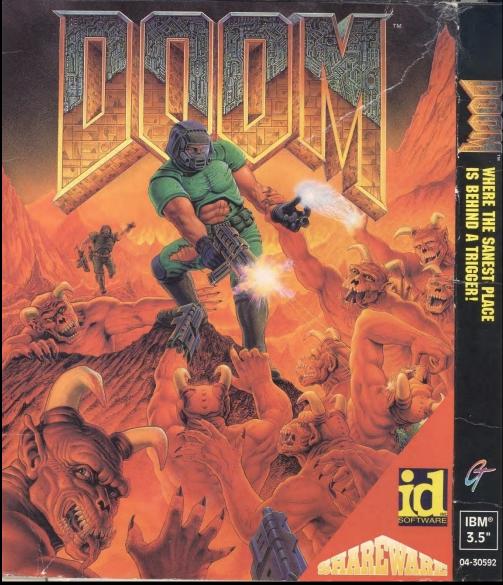
Tristan Pope, "Not Just Another Love Story" (2005)

## How we got game ...





Pals for Life, "Leeroy Jenkins" (2005)



DOOM, id Software, 1993



Speedrun demo from the Quake done Quick project, 1996-



#### The Rangers, "Diary of a Camper" (1996) The first machinima project: a Quake demo movie

Home	Forums Replays	Audios Articles	Interviews Fanart	AP SI	
WCReplays.com Community Forums (http: Member Chat (http://www.wcreplays.com/fo - Game 2 of WCG Final (http://www.wcre	orums/forumdisplay.php?f=2)				
whakojacko					10-10-2004 05:46 PM
Game 2 of WCG Final					
Was anyone there to see it? I was, it it wa insane. The whole crowd was silent it was was also good, but not as good as 2. Gj gru	so funny, noone had figured out				
d1ck0fDnkyKong					10-10-2004 07:16 PM
yo where can i watch the grubby v rex mat	cchup				
0)Z					10-10-2004 08:07 PM
this site					
Deathapult					10-10-2004 08:37 PM
man i saw that in person, and everyone in	the stands just went insane.				
xxprzn-angelqtx					10-10-2004 08:40 PM
what i dont understand is the LS kill didnt g	jive him experiance? i didnt know	w that Is kills didnt give	exp :(		
renrut					10-10-2004 08:43 PM
No, since it's out of view/in fog of war area	a, you don't get exp, BUFF plz				

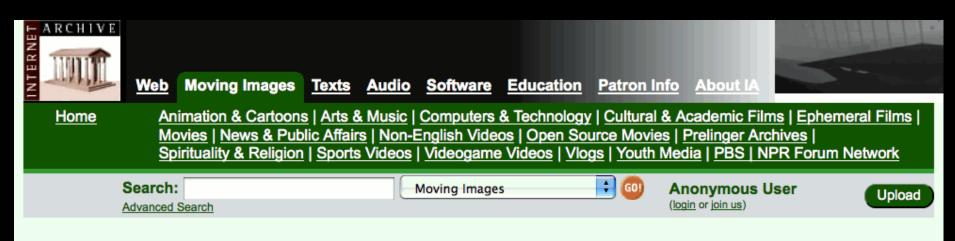
#### WCReplays.com, Oct. 2004

5 Oct 2009



Grubby vs. Zacard (WelcomeTo), World Cyber Games, 2004 Screenshot from replay run in game engine

## Archiving Virtual Worlds



#### Moving Image Archive > Archiving Virtual Worlds

Spotlight Item	Welcome to Archiving Virtual Worlds	205 items	Most Downloaded Items Last Week more
Tabula Rasa: The Final Stand "Last night[28 Feb 2009], the MMO universe lost one of its own as Tabula Rasa 's AFS warriors stormed back to Earth for the final epic battle in New York's shattered streets. The	The Virtual Worlds video archive is dedicated to investigation and historical preservation of docurvirtual worlds. This collection is a collaborative effort of the How Game Project of the Stanford Humanities lab, as Preserving Virtual Words project funded by the N Information Infrastructure Preservation Program funded by the U.S. Library of Congress. Groups University of Illinois, University of Maryland, and Institute of Technology are also partners in this i project.	mentation of w They Got s part of the National Digital (NDIIPP) at the I Rochester	<ol> <li>Onlive Traveler: AVATARA Documentary by 536 Productions - Donato Mancini, Jeremy Turner &amp; Patrick "Flick" Harrison (2003) 85 downloads</li> <li>EA-Land: The Final Countdown</li> </ol>



"Lucasfilm's Habitat -- it's a wonderful new place that's simply out of this world. Coming to life only on QuantumLink."

Stanford Humanities Lab			Welcome low	ood <u>Help Admi</u>	n <u>Settings Archive This! Templates</u> ! <u>Reset Password</u>   <u>English</u> E		
RCHIVE-IT							
tome <u>Collections</u> <u>Crawls</u>	Reports Access Help						
Stanford Humanities Lab - We	eb Archive			Partner Home	Welcome to Archive-It		
Partner Since January 2008					This home view gives you an overview of		
Current Subscription (start	ted on 01-Jan)	All Subscription Periods			your account activity including subscription start date and budget.		
Documents Crawled:	3,190,932	Documents Crawled: 7,721,072 Data Archived: 362.54 GB			To create a new collection, click the "create new collection" link from the "collections" drop down menu at the top of the screen.		
Subscription Document Budget:	5,500,000						
Budget Used:	58.02%						
Data Archived: 143.92 GB		Getting Started			To manage existing collections, select a		
Maximum Seed Count	200	Create New Collection			collection from the "collections" drop down		
Total Active Seeds:	68				menu at the top of the screen. You can also		
XML					get to your active collections by using the links under "active collections" at the bottom		
tive Collections Last Completed Crawl			Next Scheduled Crawl		of the screen. Information about current or upcoming crawls is available under the		
Digital Games	September 23, 2009 1:16:14 PM PDT	1	November 8, 2009 11:01:08 AM PST	"crawls" link at the top of the screen.			
Virtual Worlds and MMOS	August 13, 2009 1:50:03 PM PDT		November 7, 2009 12:42:43 PM PST		Learn more about getting started with		
					Archive-It Frequently Asked Questions about Archive-It Glossary of Web Archving Terms		

If you need assistance, email an Archive-It partner specialist at <u>archive-</u> itsupport@archive.org.

#### Archive-It collections: Digital Games & Virtual Worlds & MMOs

#### Metadata editor for EALand FinalCountdown

#### Bold fields below are required.

#### You may also visit the Item Manager 3

Field Name	Description	Value
identifier:	The identifier of the movie	EALand_FinalCountdown
title:	The title of the movie	EA-Land: The Final Countdown
creator:	Producer	How They Got Game Project, Stanford University
mediatype:	Indicates to the website that this item is a movie.	movies
collection:	Indicates to the website what collection this item belongs to. Must be a valid identifier.	virtual_worlds
	lasting memories are created bef brought to an end. The party was EA Town Hall (EA-Land), beginnin scheduled ending of 4 a.m. PDT. 4:35am PST, August 1st, 2008. If downloading the high quality Div The EA-Land Blog has been taken	ars are shed, final goodbyes are made, and ore the plug is pulled and the world is held in the Community Pub (Test Center 3) and g Thursday, July 31st, 11 p.m and with a The game world was officially shut down as of you have a fast connection, I recommend X version on the left.
date: subject:	Year of this movie (YYYY) Keyword(s) or phrase(s) that may be searched for to find your item. Separate each keyword or phrase with a semicolon (",") character.	2008 EA-Land; The Sims Online; Archiving Virtual Worlds
anguage:		English
coverage:	The extent or scope of the content of the resource (geographic place, temporal period, jurisdiction). For example, the place the work took place.	EA Town Hall, EA-Land

Archiving Virtual Worlds, metadata editor

### A Use Case

# Computabull <Science> Dramanite

Participants gather in the sewers of Undercity for session 2 of the first scientific conference in Azeroth. Two of characters of the conference organizer, Bill Bainbridge (NSF) are visible: Computabull (foreground) and Catullus (lip of the drainage pipe mounted on an ostrich). CREDIT: Henry Lowood

#### Science (AAAS) 9-11 May 2008

*cf.* John Bohannon, "Slaying Monsters for Science." *Science* 320 (20 June 2008): 1592.

Bohannon's reportage

## What about access?



Office hours in the digital archives

5 Oct 2009



Library in a box? Nice, but not the Ultimate Archive



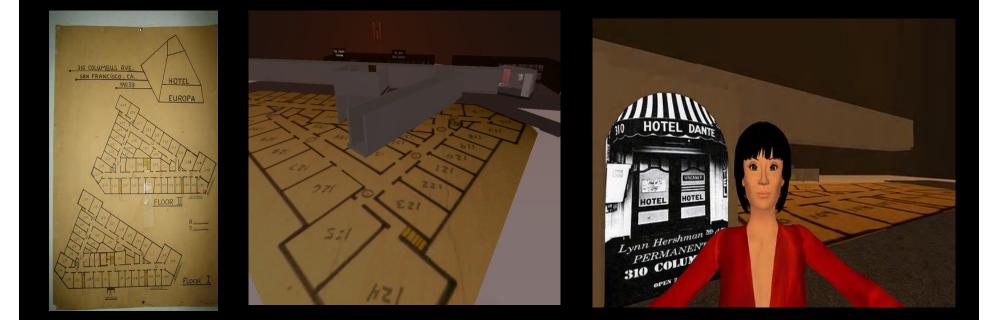




Stanford University Libraries Second Life Open House, 31 July 2009

5 Oct 2009

## An Animated Archive: Life-Squared



## Documentation > Archives > Experiences (engagement)



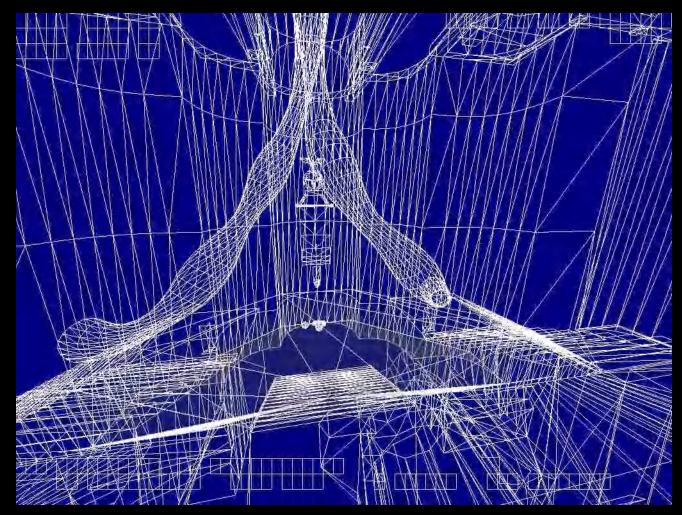
"Dinosaurs in Their Time," Carnegie Museum of Natural History, Pittsburgh



#### Sirikata



Quake 3, q3dm4 (Diesel Engine: OpenGL Quake 3 Arena map viewer)



### Quake 3, q3dm4 in wireframe view



Museum of Natural History, New York



Quake 2 Model Bump-Map Viewer (Intel, 2000)

### SDR – Collection Interface

Summary	]	SDR Admin Database Pr
LastUpdated:	6/3/2009 1:10:27 PM	

Back to Summary

Total bytes 1,781,910,431,155

Total glgabytes 1.659.5

rototype FM\_Total\_Objects 10852

1,000.0									
Total number of files 10,852									CollectionName
Ingest_Complete_Time	Agreement	AltRecordID	Object_UUID	SizeinG	Number_Files	Total_Speed	Ingested?	Label	
2007-10-24,20:41:38,371	Rumsey	28542	library_stanford_edu_500f987c82ab11dc9c3691afc06a535c	.073964566	1	0.19321357	true	Title Page: Atlas encyclopedique	Rumsey
2007-10-24,20:35:04,783	Rumsey	25722	library_stanford_edu_302dc79782aa11dcb4296131ec02772d	0.26231205	1	0.5515555	true	97 Laval.	Rumsey
2007-10-24,20:26:55,951	Rumsey	25720	library_stanford_edu_26fe46ca82a711dc8d60a79cf25e1c61	0.26231307	1	0.20551537	true	95 Vire, Avranches.	Rumsey
2007-10-22,10:18:17,541	Rumsey	28912	library_stanford_edu_ae0ad0df80c111dcae0107a2b95084cc	0.08840987	1	0.18704899	true	Contents: Atlas of Nebraska.	Rumsey
2007-10-22,10:10:12,542	Rumsey	28911	library_stanford_edu_82027efd80c011dc9eeacbee9cab47bd	0.08804104	1	0.17958969	true	Contents: Atlas of Nebraska.	Rumsey
2007-10-22,10:01:49,078	Rumsey	28910	library_stanford_edu_782101a180bf11dcbd35650be1e003b6	0.09050594	1	0.19888002	true	Title Page: Atlas of Nebraska.	Rumsey
2007-10-22,09:54:01,751	Rumsey	28909	library_stanford_edu_33551db080be11dc96be4fb61e182525	0.16943079	1	0.31776032	true	Cover: Atlas of Nebraska.	Rumsey
2007-10-22,09:44:55,038	Rumsey	288	library_stanford_edu_06ebe78a80bd11dc99c8f34720ea9ae4	0.0891611	1	0.19021034	true	Map Of The Western Reserve Including the Fire Lands In Ohio.	Rumsey
2007-10-22,09:36:54,487	Rumsey	28875	library_stanford_edu_fca7142f80bb11dc862eb330ed3a222e	.061670393	1	0.1419112	true	Countries, seas, lakes, islands.	Rumsey
2007-10-22,09:29:28,238	Rumsey	28872	library stanford edu 031acd8380bb11dc871a359013bbae49	.061670657	1	0.14964633	true	Text Page: Modern atlas.	Rumsey
2007-10-22,09:22:25,220	Rumsey	28871	library stanford edu e37171es80b911dcse6b9bc7e7511e8b	.061670415	1	0.12783504	true	Text Page: Modern atlas.	Rumsey
2007-10-22,09:14:09,898	Rumsey	28870	library_stanford_edu_b5e566d380b811dcb65e036dedc1036c	0.06167034	1	0.12604876	true	Title Page: Modern atlas.	Rumsey
2007-10-22,09:05:48,344	Rumsey	28869	library_stanford_edu_72ab469980b711dc84543351d771fb2e	0.13306709	1	0.25709566	true	Cover: Modern atlas.	Rumsey
2007-10-22,08:56:56,790	Rumsey	28851	library_stanford_edu_5a66c5a180b611dc8af4fd0b5ff13f11	.044004694	1	0.09233772	true	Costumes.	Rumsey
2007-10-22,08:48:47,808	Rumsey	28850	library_stanford_edu_35e26e7480b511dc8ee6b55fe2638fcc	.044004157	1	0.09195971	true	Cities, costumes.	Rumsey
2007-10-22,08:40:38,655	Rumsey	28849	library_stanford_edu_14fd10c580b411dc9c29139789b4990c	0.04400389	1	0.09753243	true	Village, cities.	Rumsey
2007-10-22,08:32:53,487	Rumsey	28848	library_stanford_edu_e619168180b211dc9e81c7a53a87db6c	0.02374744	1	.047963273	true	Lapland church, Palace St. Petersburgh.	Rumsey
2007-10-22,08:24:25,705	Rumsey	28845	library_stanford_edu_d6f158b680b111dca0bcb5a9e7a89f75	.023747217	1	.053562004	true	Contents: Economical atlas.	Rumsey
2007-10-22,08:16:50,569	Rumsey	28844	library_stanford_edu_cec2460480b011dca75bdb31e606acaf	0.02374781	1	.052522153	true	Title Page: Economical atlas.	Rumsey
2007-10-22,08:09:06,519	Rumsey	28843	library_stanford_edu_ae8b295880af11do8e1d75bfdc9018f5	0.0480785	1	.101719804	true	Cover: Economical atlas.	Rumsey
2007-10-22,08:01:01,685	Rumsey	28818	library stanford edu 7e1544d080ae11dca5dd3b282f058bdb	0.10829908	1	0.22632293	true	Sec. 10. Brooklyn map.	Rumsey
2007-10-22,07:52:50,771	Rumsey	28817	library stanford edu 03b5b5d980ad11dcad2f29b5ee8152f1	0.19837564	1	0.31990024	true	Sec. 9 East New York.	Rumsey
2007-10-22,07:42:14,376	Rumsey	28816	library_stanford_edu_8b175f9080ab11dcafe55d5cf03fd86d	.109372236	1	0.17805591	true	Sec. 8. Brooklyn map.	Rumsey
2007-10-22,07:31:44,066	Rumsey	28815	library_stanford_edu_1b1fda5280aa11dc9ce705e44d7ca980	0.19837649	1	0.32658768	true	Sec. 7. Brooklyn map.	Rumsey
2007-10-22,07:21:20,647	Rumsey	28814	library stanford edu e7768f2d80a811dc826d4d4a17eba950	0.19837613	1	0.3854595	true	Sec. 6. Brooklyn map.	Rumsey

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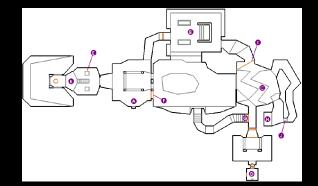
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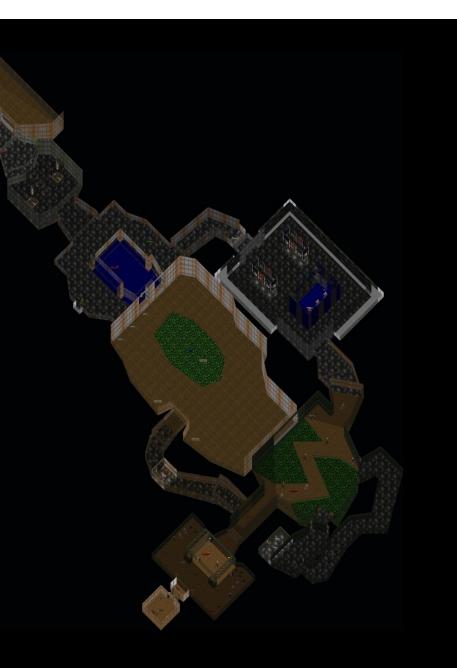
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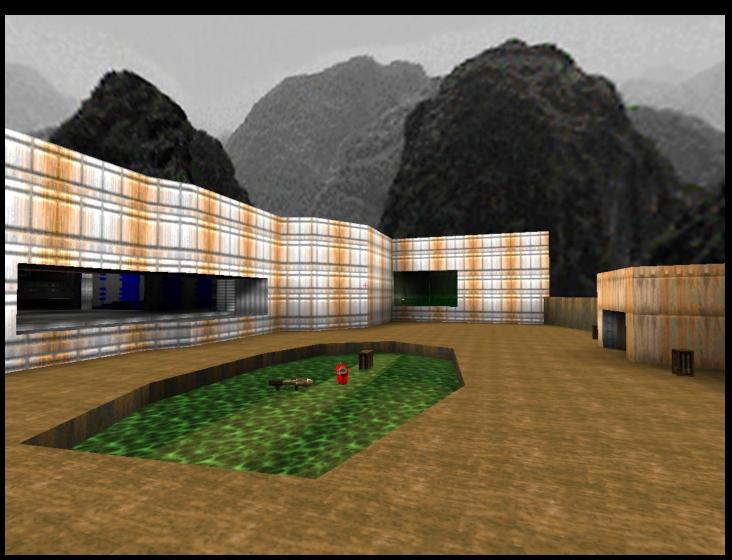




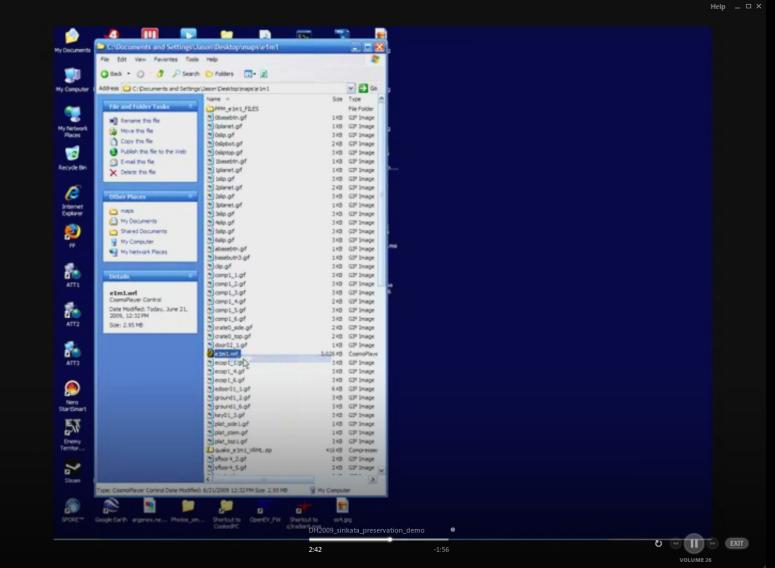
E1M1 2-d map from DOOM Wiki

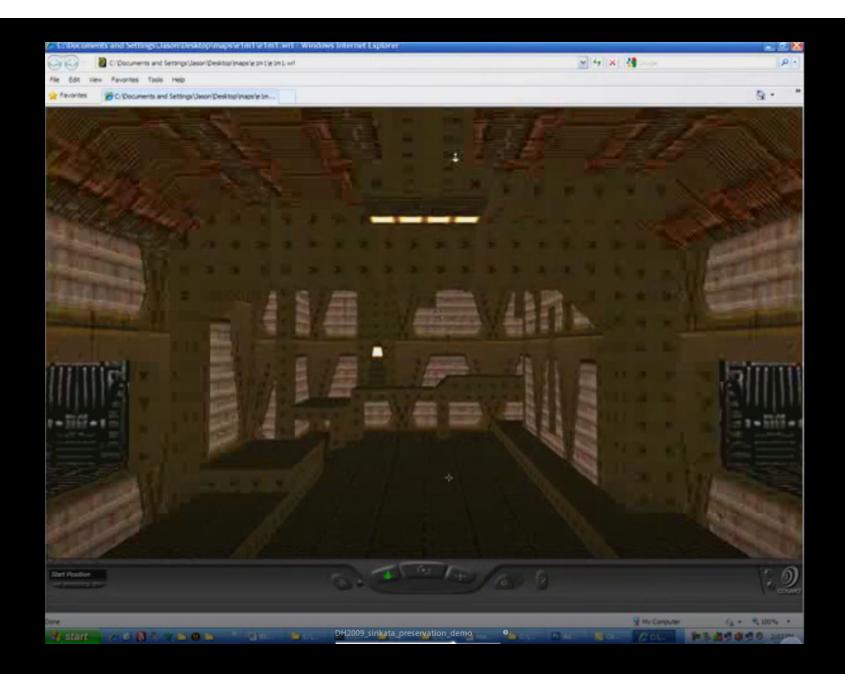
Ian Albert, DOOM E1M1 ("Hangar") rendering from WAD file, 3-d projection (Java program)





DOOM E1M1, Hangar, in Quake





#### As if that weren't enough ...







# UC Davis KeckCAVES

# "Quake 3 Arena Level Renderer"

Cave Quake III Arena, UC Davis



Group performance in Lord of the Rings Online (2008)



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