

Carnegie Mellon University

Entertainment Technology Center

Increasing Interest in Information Repositories through Games

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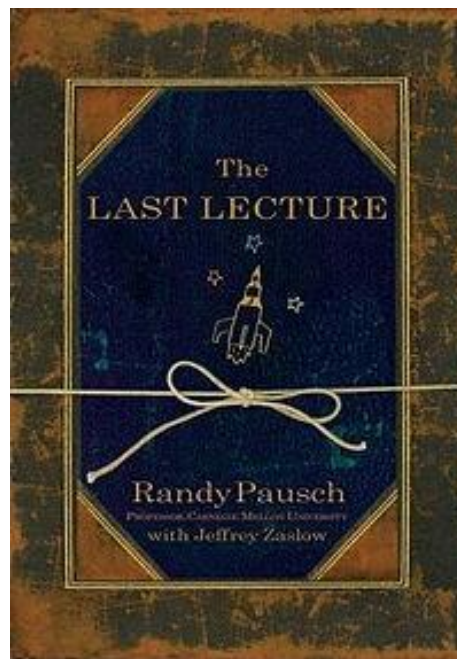
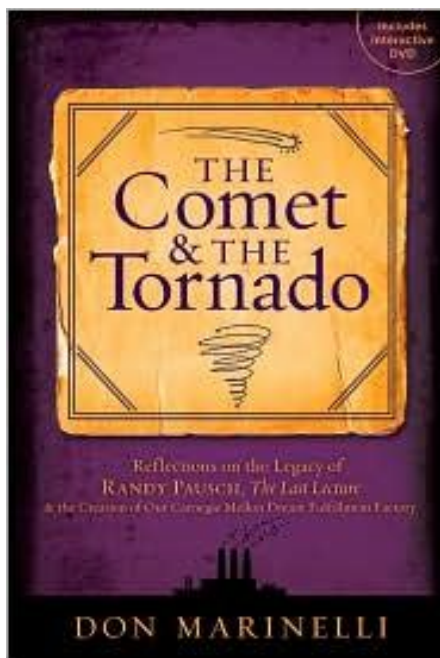
ETC: Technology + Art

2-year graduate degree: MET



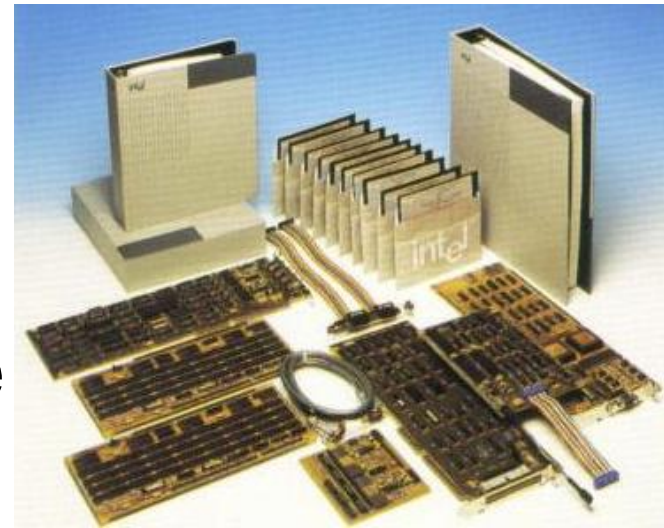
ETC: Founded in 1999

- Don Marinelli and Randy Pausch, first co-directors (Drama and Computer Science)
- Drew Davidson, current ETC Director



My Experience with Digital Libraries

- The beginnings of digital video: RCA/Sarnoff Labs and DVI
- Carnegie Mellon Computer Science: Deciphering video as information source
- Carnegie Mellon Entertainment Technology Center: Interactive engaging experiences



Informedia: Find within Video

- Founded in 1994 with Howard Wactlar, Takeo Kanade, Alex Hauptmann et al.
- Integrates speech recognition, image processing, language processing, HCI, machine learning



Power of Stories

- Informedia data sets, e.g., oral histories, rich with stories, but user has to do the digging
- ETC core courses: *Building Virtual Worlds* (BVW), *Visual Story*, *Improvisation*
- Games can “hook” users with story; increase interest in libraries



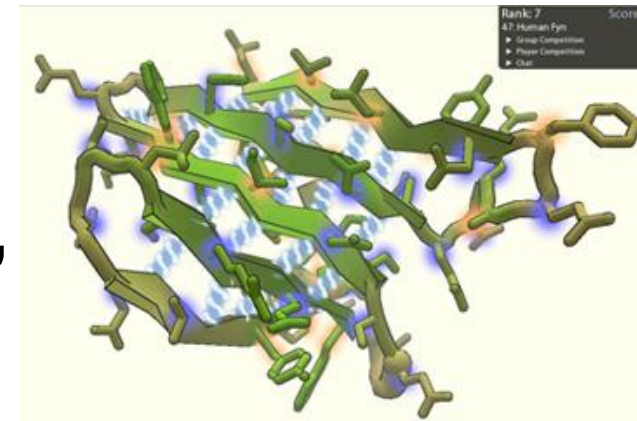
Games with a Purpose

- “GWAP” – popularized by Louis von Ahn at Carnegie Mellon
- *ESP Game*
- Licensed by Google, *Image Labeler*
- Metadata generation as by-product of play
- von Ahn & Dabbish
CACM 2008 paper, DOI
10.1145/1378704.1378719



GWAP: Benefitting Science

- *Foldit*, Univ. Washington Center for Game Science, 2008
- Protein-folding game leveraging human spatial reasoning
- Scientific publications with Foldit players as co-authors, e.g., 2011 article with DOI [10.1038/nsmb.2119](https://doi.org/10.1038/nsmb.2119)



GWAP and the Player

- GWAP can generate metadata for information repositories
- GWAP can generate new scientific data
- I will delve into another purpose for games: changing the player rather than capitalizing on “human computation”
- What can games do for the player?



Transformational Games

- Jesse Schell, fellow ETC faculty member
- *The Art of Game Design*
- “Games that change the player....”
 - Educational
 - Behavior
- Some examples follow...



Tangent: Transformational Spaces

- YOUmedia (Chicago Public Library)
- “...explicitly designed to facilitate the movement of young people into deeper and more complex engagement in learning with digital media and books”



- THE TEAM**
- DESIGN PROCESS**
- POST-MORTEM**
- GALLERY**
- MEDIA**



Chicago USA: Invasive Species

ETC project: *Invasion!!* (at *BrainPop* games pages – <http://www.brainpop.com/games/invasion!!/>)

The Field Museum

The Field Times

NEW CARP CZAR APPOINTED!

MIKE

PLEASE ENTER YOUR NAME

CLICK HERE TO CONTINUE



CHICAGO

CHICAGO

LAKE MICHIGAN

YOUR job is to stop the Asian carp from reaching Lake Michigan. To WIN, collect 10 GOLD STARS. You get 1 GOLD STAR each turn if the Asian carp do not advance. You lose 1 gold star if the Asian carp advance during your turn.



MIKE

PUBLIC APPROVAL

YOU HAVE 3 ACTIONS LEFT THIS TURN
CHOOSE AN ACTION

BUILD **DRAW/PLAY CARD**

STATUS:

INDUSTRIES TOURISM - RECREATION SURROUNDING STATES ADVOCACY

CHICAGO

LAKE MICHIGAN

ETC Imagica: Biomes for Children



Imagica: 1 Semester, 6 Students

Producer, UX designer, 2D/3D artist, animator, interaction & tech programmer



Iterative Playtesting with Imagica

- Tablet-driven experience for 8-11 year olds
- Marine biologist validates content
- Child-testing confirms appeal of experience



ETC Project Ursa: World Hunger

- Created *Feed*, played at Games for Change
- Outdoor, many-player game

Jack Koo
Art

Yan Jin
Game Designer

Tim Rosko
Sound Designer / Writer



Xuyan Ke
Programmer

Alex Hu
Programmer

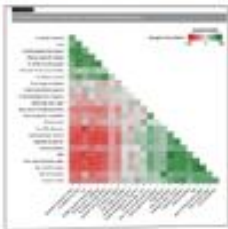
Lisa Elkin
Producer

Janet Lin
Producer



Research Behind *Feed*

GIVING
what we can



Corruption

RIISING FOOD PRICES, SOCIAL MOBILIZATIONS,
AND VIOLENCE: CONCEPTUAL ISSUES IN
UNDERSTANDING AND RESPONDING TO THE
CONNECTIONS LINKING HUNGER AND CONFLICT

SILVIA MALALA
Professor, School of Nutrition, Food and Policy, Tufts University, Boston, MA

CONFLICT: A CAUSE AND EFFECT OF HUNGER
By Ellen Messer, Marc J. Cohen, and Thomas Robinson



Conflict

World Wide Maze
Spaceship Pilot
Multiplayer OSMOS
Cookie Clicker
Node.js

Web-based Games

WAY, Climate Defense, Half the Sky
Bioharmonious, Inside the Haiti Earthquake
Ayiti: The Cost of Life
Thirst, NeoColonialism
Nation States, NarcoGuerra
Superbetter

Games for Change



Distribution

Isle of Tuna Mobile
Neopets, Bear Hunter, Fennia, Ghost
Turn Yourself into Pixels
Smugglers and Spies, Blind Bell
Cytus, Capture the Flag, Pokemon
Chin World, Wow Name Tags, Enemy Defender, Arathi Basin
Red Light Green Light, Sunny Day, Shadow Tag
Go Tutorial, Games Three, Sudio Fish, Project Assassin
Flight Simulator, Barthol Games
Quarter Football, Parallelweb

Large / Outdoor Games



ETC Project: Electric 4 Education

- Produce intergenerational literacy game for 6-9 year olds and their parents
- Fielded at Public Broadcasting System activities website:

www.pbs.org/parents/electriccompany/electric-racer.html



A screenshot of the 'Electric Racer' game page. The page has a blue background with a lightbulb icon. The title 'Electric Racer' is prominently displayed. Below the title, there is a 'Download and Drive!' section with a description of the game and a photo of a family playing on a laptop. On the left side, there is a navigation menu with 'Parents Home' and 'Activities' buttons, and a list of links including 'Tips for Everyday Literacy', 'Electric Racer', and 'Prankster Planet'.

ETC Projects: ENGAGE

- ENGAGE program includes promoting scientific literacy for children ages 4-12
- Many ETC projects involved, many games produced: <http://www.etc.cmu.edu/engage/>



The image shows the title screen for the game 'Sci-Fri Impact!'. The background is a dark purple space with stars and colorful geometric shapes. The title 'SCI-FRI' is in large white letters, with 'Impact!' below it. A list of names is displayed on the right side of the screen.

John Balash Nora Bastida Chandana Bhargava Sean Brice
Matt Champer Danny Hausmann Weiwei Huo Xun Zhang

SCI-FRI

Advisors
Scott Stevens Mike Christel

fun
weight
distance
science

SEAN BRICE
MATT CHAMPER
SAM COLLIER
YILIN FAN
NEERAV MEHTA
ARSENIY KLISHIN
SAKAR KHATTAR
NI MU

ADVISORS:
MIKE CHRISTEL
SCOTT STEVENS

Promoting Systems Thinking

- GameGrid ETC team, Fall 2013
- Work with Creativity Labs, Indiana Univ.
- Produced a game to give children practice with and stimulate interest in systems thinking: *Water+*
- Game uses Unity Web Player:
<http://www.etc.cmu.edu/projects/gamegrid/>



Educational Games: Community

workingexamples.org

Many ETC projects detailed there as “Seed-Sprout-Bloom”:

- GameGrid (*Water+*)
- *RumbleBlocks*
- *Beanstalk*
- *PuppyBot Rescue*

The screenshot shows the homepage of workingexamples.org. At the top, there are navigation tabs for EXAMPLES, GROUPS, PEOPLE, and BLOG, along with SIGN UP and LOGIN links. The main content area features a video player with the text "A different kind of online community. Working Examples is a vehicle for ideating and building radical innovations to change education. We are a community of researchers, designers and educators working at the intersection of education and technology. Join us, create something revolutionary." Below the video is a user profile for "Dylan" and a "eRO func" logo. A large green box says "Explore Examples". Other tiles include "Connect With Groups", "How To Use Wex", "Check Out Our Blog", and a "Beanstalk" game tile. The Carnegie Mellon University Entertainment Technology Center logo is visible in the bottom right.

ETC: Many Projects, Many Experiences





Game Building Blocks

- Player interactions and control
- Art (theme, 2D/3D, style)
- Design (see Schell book for 100 lenses)
- Photographs
- Video (animations, real-world video)
- Audio (sound effects; music tracks)
- As with Informedia, “integration” can produce experience greater than sum of the parts



Summary

- Games can be transformational, including literacy and science literacy
- Games can drive people to libraries:
 - YOUmedia, *Invasion!!*
 - Imagica www.etc.cmu.edu/projects/imagica/
 - Ursa (*Feed*) ...projects/ursa/
- Games can introduce topics
- Further information
 - www.workingexamples.org
 - www.etc.cmu.edu for ETC and its projects

