USC Viterbi

School of Engineering

Creating the Future of Interactive Games

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GAME PIPE

The USC GamePipe Laboratory Mission

The mission of the USC GamePipe Laboratory is research, development & education on technologies & design for the future of interactive games & their application.

- from developing the supporting technologies for increasing the complexity & innovation in produced games,
- to developing serious & entertainment games for government & corporate sponsors.

Game Development Degree Programs

BS in Computer Science (Games)

- The goal of the BS degree is to educate students capable of engineering next generation games immediately upon graduation. Students in this program receive a solid grounding in Computer Science in addition to the art and design required for functioning in the game industry.

MS in Computer Science (Game Development)

- The goal of the MS degree is to graduate professionally educated students capable of engineering next generation games and their required technologies.

Degrees started Fall 2006.

We just completed our fourth year of operation.

GAME PIPE

BS in Computer Science (Games)

Computer Science (37 units)

Programming & Software Development

CSCI 101 (3) Fundamentals of Computer Programming
CSCI 102 (4) Data Structures
CSCI 105 (2) Object-Oriented Programming (C++ version)
CSCI 201 (4) Principles of Software Development (C++ version)
CSCI 377 (3) Introduction to Software Engineering

Theory

CSCI 271 (3) Discrete Methods in Computer Science
CSCI 303 (3) Design & Analysis of Algorithms

Hardware & Systems

CSCI 402 (3) Operating Systems
EE 450 (3) Intro to Computer Networks
CS/EE 352 (3) Computer Organization & Architecture

Autonomy & Immersion

CSCI 460 (3) Artificial Intelligence
CSCI 480 (3) Computer Graphics

Core Requirements (43 units)

General Education (20 units)

Science (4 credits)
PHYS 151LG (4) Fund. Of Physics I: Mechanics & Thermodynamics

Writing (7 credits)
WRIT 140 (4) Writing and Critical Reasoning
WRIT 340 (3) Advanced Writing

Math (12 credits max)
MATH 125 (4) Calculus I
MATH 126 (4) Calculus II
MATH 225 (4) Linear Algebra/Diff. Equations or EE 241 (3) Applied Linear Algebra for Engineering

Highly recommended
MATH 226 (4) Calculus III
EE 364 (3) Introduction to Probability and Statistics for Electrical Engineering

USC GamePipe Laboratory
http://gamepipe.usc.edu

Game Development

Game Engineering (11 units)

CSCI/ITP 380 (4) Videogame Programming
CSCI/EE 452 (3) Game Hardware Architectures
CSCI 487/ITP 485 (4) Programming Game Engines

Game Design (8 units)

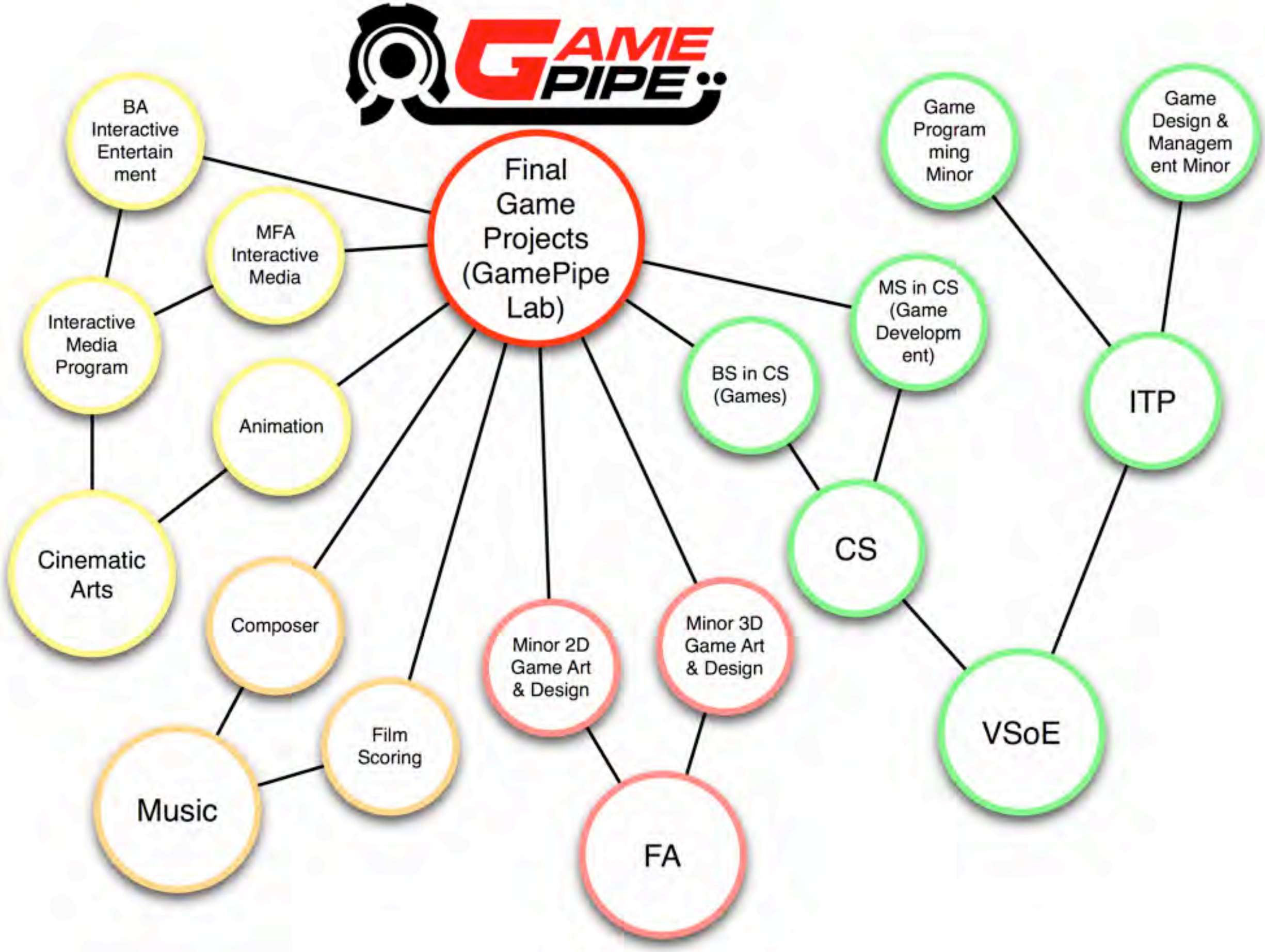
CTIN 488 (4) Game Design Workshop
CTIN 484 (2) Intermediate Game Development
CTIN 489 (2) Intermediate Game Design Workshop

Technical Electives (6 units)

Game Cross-Disciplinary (23 units)

CSCI 180 (3) Survey of Digital Games & Their Technologies
CSCI 280/ITP 280x (4) Videogame Production (Individual Projects)
CSCI 281 (3) Pipelines for Games & Interactives
CSCI 282 (2) Animation for Games
CTAN 452 (2) Intro to Computer Animation
CSCI 486 (3) Serious Games Development
CSCI 491a (4) Final Game Projects
CSCI 491b (2) Final Game Projects

BS in Computer Science (Games)


GAME PIPE
Final Game Projects (GamePipe Lab)
BA Interactive Entertainment
MFA Interactive Media
Interactive Media Program
Animation
Cinematic Arts
Composer
Film Scoring
Music
Minor 2D Game Art & Design
Minor 3D Game Art & Design
FA
BS in CS (Games)
MS in CS (Game Development)
Game Programming Minor
Game Design & Management Minor
ITP
CS
VSoE

CTIN 484 (2) Intermediate Game Development
CTIN 489 (2) Intermediate Game Design Workshop

Spring semester

Game Designs from CTIN, FA & CS Students from Spring are fully developed over Summer

CS-281 Pipelines for Games & Interactives

3D models, animations & assets CS & Fine Arts students

CSCI-282 Animation for Games

Game animations & MOCAP CS, CTAN & FA students

CS-491A & CTIN 491A Final Game Project
CS-529A Advanced Game Projects
& then we do CS-491B & CTIN 491B & CS-529B in Spring

Fall semester

CS-522 Game Engine Development

Game engines & advanced game software technology CS students

Concurrent courses

Produced Game Prototypes Joint Demo Day CS, CTIN, CTAN, Music & FA students

Cross-disciplinary coordination architecture for the Final Game Projects and Advanced Game Projects courses.

*** Other courses utilizing production pipeline:**
CS-486 Serious Games
CS-523 Networked Games
CS-524 Networked AI
CS-526 Mobile Games

Version 8.4

http://gamepipe.usc.edu/Masters.html

MS in Computer Science (Game Development)

CS Core (9 credits)
You must take the following two courses:
CS 570 Analysis of Algorithms
CS 580 3D Computer Graphics & Rendering
You must take one of the following courses:
CS 555 Advanced Operating Systems
CS 561 Artificial Intelligence
(or CS 573 Advanced Artificial Intelligence)
CS 571 Web Technologies
CS 577a Software Engineering
CS 585 Database Systems
EE 557 Computer Systems Architecture

Game Development Core (11 credits)
CTIN 488 Game Design Workshop (4)
CS 522 Game Engine Development (4)
EE/CS 452 Game Hardware Architectures

Electives - choose a concentration area & Complete Two Classes in That Area
(6 credits)
Infrastructure
Cognition & Games
Immersion
Serious Games

Project Classes (7 credits)
CSCI 529a Advanced Game Projects (4)
CSCI 529b Advanced Game Projects (3)
(take in semester 3 and 4)

Infrastructure
CS 503 Parallel Programming
CS 520 Computer Animation & Simulation
CS 523 Networked Games - Design & Implementation
CS 524 Networked AI
CS 526 Advanced Mobile Devices & Game Consoles
CS-599 Advanced Game System Development (2)

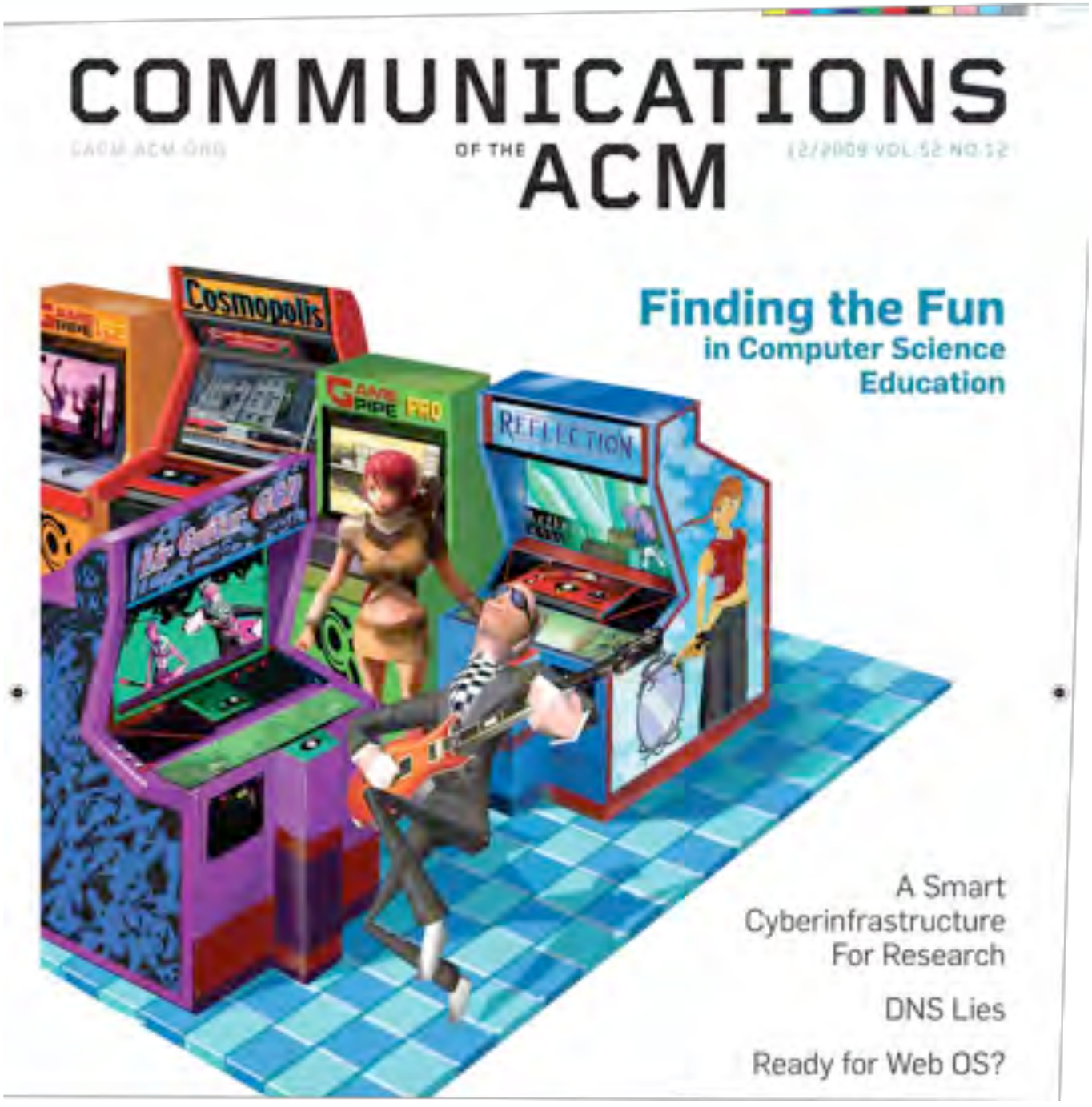
Cognition & Games
CS 524 Networked AI
CS 534 Affective Computing
CS 535 Game Based Learning
CS-541 AI Planning
CS 543 Software Multiagent Systems
CS 569 Integrated Intelligent Systems
CS-573 Advanced AI
CS-599 Advanced Game System Development (2)

Immersion
CS 520 Computer Animation & Simulation
CS 523 Networked Games - Design & Implementation
CS 537 Immersive Environments
CS 538 Human Performance Engineering
CS 574 Computer Vision
CS 588 Specification & Design of UI Software
CTAN 502A Virtual Reality & Stereoscopic Animation
EE 619 Advanced Topics in Speech Recognition & Spoken Language Engineering
CS-599 Advanced Game System Development (2)

Serious Games
CS 486 Serious Games Development
CS 520 Computer Animation & Simulation
CS 535 Game Based Learning
CS 537 Immersive Environments
CS 538 Human Performance Engineering
CS-599 Advanced Game System Development (2)

MS in Computer Science (Game Development)

CACM Dec 2009



A paper on the degree program is available in the December 2009 Communications of the ACM

Michael Zyda, Computer Science in the Conceptual Age, CACM, Dec 2009

Internship & Placement

- EA
- LucasArts
- Microsoft & MGS
- Activision
- Google
- Akamai
- Sony Computer Entertainment
- Disney
- 2K Sports
- THQ
- CNET Networks
- Bionic Games
- Alelo
- Zynga
- Blizzard
- Seven Studios
- Applied Minds
- Qualcomm
- Pricegrabber
- Gearbox
- Velvet Games
- Happynin Games
- Basically everywhere in the Game industry

Demo Day Attendance

EA
Microsoft Game Studios
Activision
LucasArts
Blizzard
Creative Artists Agency
Disney – all parts
Nokia Research Labs
Bally Tech
Insomniac Games
Happynin Games
Sony Online & Computer Entertainment
Applied Minds
NaughtyDog
Seven Studios
Zero G Games
Sandia National Laboratories
Zynga
Velvet Games
Heavy Iron Studios

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