Computer Graphics
Technology and Market

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Trivia Quiz: Famous Computer Graphics Startups

- John Warnock
- Ed Catmull
- Jim Clark
- Ivan Sutherland
- Alan Ashton
- Chuck Seitz
Trivia Quiz: Famous Computer Graphics Startups

- John Warnock (Utah 1969)
- Ed Catmull (Utah 1974)
- Jim Clark (Utah 1974)
- Ivan Sutherland (MIT, Utah)
- Alan Ashton (Utah 1979)
- Chuck Seitz (Utah)
What I am going to talk about today

- Computer Graphics Industry
- Business Opportunities
- CSE Computer Graphics Curriculum
- Campus Resources
What is Computer Graphics?

- Generate synthetic images that look real!
- Also imaginary worlds (art)
- Real-time (games)
- Accurate (Science, Engineering, Medicine)
- Ease of use (user interface)
Computer Graphics Industry

- Graphics/Visualization Software
- Games
- Animation Studios
- Visual Interface
- Digital Art/Publishing
- Hardware Design/Manufacture
Flight Simulation

- About 17,000 new pilots would be required between 2006 and 2025
- Flight Simulations - give you chance to be pilot of just about any plane or helicopter
- Aviation and Entertainment industry
- CAE (www.cae.com); www.flightsim.com
CAD/CAM

- Computer Aided Design and Manufacturing
- Boeing 777 design ($1B +)
- www.geocities.com/cadcammworld/
Animation Studios

- Motion picture industry: Toy Story, Jurassic Park, Wall.E and more
- Visual effects for commercials
- Pixar, Digital Domain, Industrial Light & Magic (ILM), Rhythm & Hues
Video Games

- Computer games has a huge industry which drives the development of many software/hardware tools
- On-line games become increasingly popular
- Electronic Art (www.ea.com), id (www.idsoftware.com)
Video Games

- Employment increase: 12% in US, 17% in Canada
- 65% of American households play computer or video games
- The average game player age is: 35 (26% of gamers were over the age of 50 in 2008)
- 22% of frequent game players played online games. Increase from 8% in 2004
- 41% of Americans expect to buy games in 2008
Visualization

• Software for analyzing data from biomedical imaging, oil and gas, large simulations, and computer vision applications

• Kitware: RPI and GE

• www.kitware.com
Visual Analysis

- Visual analysis and web-based analytic software
- Business or census data
- Originated from Standord University
- www.tableausoftware.com
Graphics Hardware

• Producing graphics accelerators used for video/3D games

• Now has been extended to general purpose computing (GPGPU)

• Nvidia (www.nvidia.com) and ATI (http://ati.amd.com/)
CPU vs. GPU

**Pentium Extreme Edition 840**
- 3.2 GHz Dual Core
- 230M Transistors
- 90nm process
- 206 mm^2
- 2 x 1MB Cache
- 25.6 GFlops

**GeForce 7800 GTX**
- 430 MHz
- 302M Transistors
- 110nm process
- 326 mm^2
- 313 GFlops (shader)
- 1.3 TFlops (total)
Graphics Hardware

- Virtual reality devices
- Manufacturing /Assembling large scale display walls
- Cyviz (www.cyviz.com)
Education

- pbskids.org
- Alice: An education software that teaches students computer programming in a 3D environment
- Provide the students with their exposure to object-oriented programming
- A project from CMU
- www.alice.org
Business Opportunities

- Venture Capital
- Government SBIR (NASA, DOD, DOE, etc)
  - Phase I: $100,000 for one year; Phase II: more and multi-years
- IFund for iPhone applications
IFund

- $100M investment initiative by KPCB
- Look for revolutionary ideas for iPhone and iPod touch platform
- Focuses:
  - location based services
  - social networking
  - mCommerce (advertising and payments)
  - communication
  - entertainment
iPhone Software

- iPhone 2.0 software allows third-party development of applications for iPhone/iPod Touch
- Extensive development resources on the web (iPhone SDK with OpenGL ES is free for download)
- Anyone can do it and sell his/her own software in apple store
- Price range: free/$0.99/$1.99/$4.99 etc
What do I have in my iPhone?

- Internet radio
- Air Sharing
- Touch Term
- Skype
- Stanza
- Harmonica
- AroundMe
- Channel Guide
- Crash Kart
- iFish
- Weather
- Google Voice Search
What is your idea??
Graphics Courses

CSE 581 (Au, Sp)
CSE 681 (Au, Wi)
CSE 682 (Wi)
CSE 781 (Wi)
CSE 782 (Au)
CSE 694 (Sp)
CSE 784 (Sp)
Campus Resources

- The Advanced Computing Center for Arts and Design (ACCAD)
- The Ohio Supercomputer Center
Final Remark

Whom should you make friends with?

- Art and design
- Computer vision and artificial intelligence
- Physics
- Mathematics and Statistics
- Network and Systems
- Software Engineering
Questions?