Why Grad School?

Graphics Research!

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BS, MS, and PhD

- BS: 4 years
- MS: 1.5 to 2 years
- PhD: 4 to 6 years, or more …
Why you should NOT go to Grad School

- Feeling burnt out with studies after BS
- A pressing desire to go out to the “Real World”
- Start-up ideas that can’t wait
- Need to start making real $$ right away
CS Salary Comparisons

- BS : $50K
- MS: $70K
- PhD: $100K
- Above are ballpark numbers.
- Actual salaries can be higher or lower based on geographic area, and specialization
Job comparisons

• BS
  – Greatest job opportunities
  – Job usually gets boring after a while
  – Little control over everyday tasks

• MS
  – Reasonably good job opportunities
  – Management potential
  – More control over everyday tasks

• PhD
  – Job opportunities limited, but so is the candidate pool
  – Only way to become a Prof!
  – Considered by some to be a “Technical MBA”
  – High control over everyday tasks
Grad School Cons and Pros

- Several years of “low” wages
- Usually higher starting salaries make up for lost wages but not always, …

- Intense study for several more years after BS
- You get the label of an *Expert*

- Gets harder to switch fields with specialization
- You get more control over your jobs and career
Grad School Timing & Options

- **Part-time Grad School after BS**
  - Employer pays for your MS/PhD
  - Do-able, but usually stressful
  - Like doing two jobs at the same time

- **Full-time Grad School after few years of real job**
  - Possible, but usually very hard
  - Very difficult to lower the standard of living to grad school stipends
  - Family and mortgage

- **If you are considering Grad School, best time is right now (after BS)**
Computer Graphics and Virtual Environments Research

The computer is a window into a virtual world that looks real, feels real, and acts real

paraphrased from Ivan Sutherland (1968)
Graphics Research

- Computer to Human Communication:
  - Scientific Visualization
  - Information Visualization

Flow Fields for Space Shuttle Launch Vehicle
Image Courtesy: Fred Martin et al., NASA Johnson Space Center
Graphics Research

• Human to Computer Communication:
  – Virtual Design

Virtual Car
Images courtesy Daimler-Chrysler
Graphics Research

- Human to Human Communication:
  - Virtual Walkthroughs
Graphics Research

- Interleaved Computation and Display
  - Drug Design

Complementarity of Transthyretin Domains
Tele-Immersion and Augmented Reality

Murder Scene Visualization

Virtual head at UMD M circle
Multiresolution Analysis and Light Transport

Statistical Geometry Modeling

Subsurface Illumination Scattering
Graphics Research: Interdisciplinary Nature

- *Computer Science*: software systems, hardware, algorithms
- *Mathematics*: Projective and differential geometry, linear algebra, …
- *Physics*: Optics, energy transport, matter, …
- *Biology*: Human visual system
- *Psychology*: Perception
- *Art*: Aesthetics
Job prospects in Graphics

• Emerging field with many opportunities: most top CS departments don’t yet have full professors in graphics
  MIT, CMU, UIUC, Wisconsin, Princeton, Harvard, Michigan, …

• Computer Graphics companies:
  Pixar, ILM, NVIDIA, ATI, SoftImage, Alias|Wavefront, Cyberware, Rhythm&Hues, Fakespace, Viewpoint, EA, …

• Major computer companies:
  Microsoft, HP, IBM, Sun, Sony, Intel,…

• Others: GE, Boeing, Ford, Glaxo, Nokia, NASA, LANL, …