Overview:

Administrative
Exam 2 - topic summary
Exam 2 - what to expect
Course evaluations!
MAE 473-573: Lecture #38 - Exam #2 Review

• Administrative

• Partner grading - HW5, HW6, Final project - forms! (To be completed WITHOUT consent of your partner!)

• NYSCEDII tour - next Wednesday (12/5/01) - Protocol:

  Report to 5 Norton Hall at the following times:
  A-C:  3:55 pm
  D-M:  4:20 pm
  N-Z:  4:40 pm

• Final project presentation details - handout!
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• Exam 2 - topic summary

  • OpenGL Programming
  • Shading concepts
  • Lighting concepts
  • Mathematics of points/lines/planes
  • Curves
  • Surfaces
  • Textures
  • Animation
  • Stereo Imaging
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• Exam 2 - topic summary - specifics...

**OpenGL Programming:**
ModelView and Projection Matrices
Function Callbacks- what are they, how do they work?
generically, how to create geometry (glBegin/glVertex/glEnd)
pushing and popping matrices
identity matrix
colors
normals
materials
lighting- ambient, diffuse and specular,
and how it interacts with materials
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• Exam 2 - topic summary - specifics...

More OpenGL Programming:

Two strategies
• transform on draw
• transform then draw

ordering of matrix operations in OpenGL
coordinate system
camera/world trigonometry
how to accomplish motion
how to rotate your world
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• Exam 2 - topic summary - specifics...

Shading concepts:
  Painter’s Algorithm (Depth-sort algorithm)
  Warnock’s algorithm (Area subdivision)
  Appel’s Method
  Z-buffering (depth buffer shading)
  Scan-line algorithms
  Shading shortcuts (constant, Goraud, Phong)

Lighting concepts:
  Ambient Light
  Diffuse reflection
  Specular reflection
Exam 2 - topic summary - specifics...

**Mathematics of points/lines/planes:**
- Is a point on a line (2D)? (Scan Line approach)
- Is a point on a plane (3D)? (Warnock’s - case 4)
- Intersection of a line and a plane (view vector-display plane)
- Outward normal calculations (dot/cross product)

**Curves**
- Bezier
- B-spline (cubic)

**Surfaces**
- Lofted/ruled surfaces - interpolate between boundary curves u,w
- Linear “coons” patches - dual interpolation
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• Exam 2 - topic summary - specifics...

Textures:
- what is texture mapping
- benefits of texture mapping
- downfalls of texture mapping
- texture mapping coordinates
- levels of detail
- mipmaps
- texel to pixel mapping strategies
- OpenGL steps for texturing
- magnification and minification
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• Exam 2 - topic summary - specifics...

**Animation:**
- Geometry Variables = f(t,U)
- Generic algorithm for Animation
- Graphics pipeline
- Idealized Drawing (only as fast as refresh)
- Idealized Animation
- How to tie animation to system time (conceptually)

**Stereo Imaging:**
- Perception cues (monocular/binocular)
- Techniques for generating stereo images
- Historical - Viewmaster
- Mathematics of Stereographic Projection
- Parallax revisited
- “Simulated” vs. “True” stereo
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• Exam 2 - what to expect - much like last time!

1 “Chugh” problem (pseudo-code)
1 “Hulme” problem (SHORT graphics theory calculations)
1 combined problem - short answer type questions

Last exam:
Average ~85............
Half the class scored 90-100..........

• Exam #2 will separate the MEN from the BOYS..........
• You know what to expect from last time............
• Be prepared!
• Course evaluations!

Please take survey seriously. These will:

Benefit the future of:
  MAE 473-573
  Chugh/Hulme from a teaching perspective

Please answer all questions and submit comments!
For BOTH instructors!

Good or bad!
Preferably good!