SolarSense

Gesture-based camera control of solar system model
AGI16 Calendar: [link]

- Tue 30 aug 13:00-15:00
  Lecture 1 – Introduction
- Fri 2 sep 8:00 – 12:00
  Lecture 2-3: Forming Groups and Brainstorming
- Tue 6 sep 13:00 – 15:00
  Lecture 4: Groups formed, inspiration, and brainstorming
- Fri 9 sep 8:00 – 10:00
  Lecture 5: Proposals
- Tue 13 sep 13:00 – 15:00
  Lecture 6: Past projects and current technologies
- Fri 16 sep 10:00-12:00
  Lecture 7: Hello World Demoes
- Tue 20 sep 13:00 – 15:00
  Lecture 8: Preparing ForskarFredag 2016
- Tue 27 sep 13:00 – 17:00
  Lecture 9: Demo and preparation towards ForskarFredag
- Fri 30 sep 8:00 – 16:00
  ForskarFredag (we set up on Thursday evening)
- Tue 4 oct 13:00 – 15:00
  Lecture 10: Reflecting on ForskarFredag
- Tue 11 oct 13:00 – 15:00
  Lecture 11: Preparing for Comic Con
- Tue 1 nov 13:00 – 15:00
  Lecture 12: Preparing for Comic Con
- Fri 4 nov 9:00 – Sun 6 Nov 16:00
  Comic Con (we set up on Thursday evening)
- Tue 15 nov 13:00 – 15:00
  Lecture 13: Forming groups for project 2
- Fri 18 nov 8:00-12:00
  Lecture 14-15: Proposals Project 2
- Tue 22 nov 13:00-15:00
  Lecture 16: Hello World Demo Project 2
- Tue 29 nov 13:00-15:00
  Lecture 17: Feedback on Demoes
- Tue 6 dec 13:00-15:00
  Lecture 18: Preparing for Open House
- Tue 13 dec 13:00-15:00
  Lecture 19: Demo project 2
- Fri 16 dec 15:00-19:00
  VIC AGI16 Open House

2016/08/30
Case: Uniview

How it works?
• Real-time rendering
• Depth sorting
• Scalegraph
• Texture map

Improvements
• ...

2016/08/30 AGI16 - L1
From Uniview

- artifacts
- light
- light source
- point light source
- diffuse light source
- texture mapping
- shadows
- reflection
- refraction
- reflectance

- camera
  - orientation
  - up vector
  - field of view
  - rotation
  - position
  - line of sight
  - Translation
  - parameters

- quaternions
- object
- position

- scale
- atmospheric dispersion
- zooming
- focal length vs.
- depth (z-position)
- specular reflection
- particles
- bump mapping
- simulation
- Animation
- interaction
Agenda

1. Introduce VIC / Uniview
2. Show past AGI
3. Introduce AGI16
4. Sign Consent form for Photos
5. Next time...
Advanced Graphics and Interaction
The Students
Students in Advanced Graphics and Interaction 2012 (AGI12) in ForskarFredag - 10

Andreas  Niklas  Eric

Johan  Robert  Joakim  Emil  André  Elvira  Jonas

2016/08/30  AGI16 - L1
It’s all about the students
It’s all about the students
It’s all about the students

Students in Advanced Graphics and Interaction 2015 (AGI15) at ForskarFredag - 28
The Team

2016
Contact Mario

- Office:
  - Lindstedtsvägen 5 – 4417
- marior@kth.se
- Mobile (txt or call) 076 258 1802
- Visualization Studio VIC
- LinkedIn
- Google Scholar Profile
- ACM Digital Library Author Profile
- ResearchGate

- ORCID
- SCOPUS
- Mendeley
- Academia
- Slide Share
- Facebook
- Twitter
- Google+
The Studio
Students’ Resources: Visualization Studio

- Research
  - Visualization Supported Collaborative Work
  - Foundational Technology
  - User Evaluations
- Showcase and classroom environment
- Outreach
Technologies in VICTHLM

- High-resolution projection wall with stereoscopy
- Oculus Rift
- HTC VIVE
- Cinema quality audio
- High-definition video communications with eye contact
- Holographic display
- Multi-touch interactive surfaces
- Eye tracking
- GPU-based computing cluster
- Haptic Devices
- 3D printer
- Epson Moverio

2016-08-30
Romero
The Learning
Students teaching themselves and each other.
Students teaching themselves and each other.
Students teaching themselves and each other.
Students teaching themselves and each other.
Students presenting to the open public.
Students presenting to the open public.
Students presenting to the open public.
Students presenting to the open public.
Students presenting to the open public.
The Seed
Assignment 1 (60 – 100 minutes)  
Due Thursday at 17:00

1. Watch these videos and answer this survey:
   1. 2012 SIGGRAPH Technical Papers
   2. 2012 SIGGRAPH Emerging Technologies
   3. 2013 SIGGRAPH Technical Papers
   4. 2013 SIGGRAPH Emerging Technologies
   5. 2014 SIGGRAPH Technical Papers
   6. 2014 SIGGRAPH Emerging Technologies
   7. 2015 SIGGRAPH Technical Papers
   8. 2015 SIGGRAPH Emerging Technologies
   9. 2016 SIGGRAPH Technical Papers
   10. 2016 SIGGRAPH Emerging Technologies

2. Browse:
   1. KTH Social
   2. Facebook AGI group

3. Look at all the projects from AGI14 and AGI15
4. Think of what you would like to build in AGI16
5. Use the Oculus and the HTC Vive in the Studio
The Challenge
Advanced(Graphic + Interaction) = Project
FORSKARFREDAG
En del av europeiska Researchers’ Night
EXPERIENCE ADVANCED GRAPHICS & INTERACTION

Open House

Friday Dec 5
15:00-19:00

VICSTHLM
AGI12 – AGI15: Friday
De utvecklar spel för säkrare vägar

Den 1 december börjar nya regler gälla för mobianvändning vid ratten. Och i samband med det utvecklar studenter vid KTH och Berghs i Stockholm ett spel som ska avskräcka förare från att köra bil och smsa samtidigt.

Stina Ekholm visar och Cadre Min, Yann Chazallon, Remi Blåcron och Henrik Boström tittar på.

Spelat går enligt studenterna ut på att uppmärksamma på farorna man utsättar sig själv och andra för när man använder telefonen bakom ratten.
Welcome to AGI16

• Intended Learning Outcomes:
  1. Collaborate to build original and stable projects that combine methods in advanced computer graphics and advanced human-computer interaction;
  2. Communicate the theory and practice of these methods at a technical and a practical level;
  3. Provide informed constructive criticism to the development of the projects from other teams;
  4. Demonstrate the projects at large public venues to open audiences.
AGI14 Grade Assignment

- Project 1 50%
- Project 2 40%
- Assignments 10%
  - < 100 minutes/week
  - Reading
  - Writing
  - Coding
  - Interacting
Project 1 (50%)

- Proposal 4% 9 Sep
- Demoes 6 16 Sep, 27 Sep, 3 Nov (MMI16)
- ForskarFredag 10 30 Sep
- Deliverable 1 5 11 Oct
- Comic Con 10 4-6 Nov
- Open House 10 16 Dec (tentative)
- Deliverable 2 5 21 Dec (tentative)
Project 2

- Proposal  5%  18 Nov
- Demoes    10  22 Nov, 13 Dec
- Open House 15  16 Dec (tentative)
- Deliverable P210 21 Dec (tentative)
Deliverables

- The deliverable consists of:
  - Working VIC Demo
  - Code with comments
  - Webpage with:
    - Description
      - Goal and motivation of the project
      - Explanation and Justification of the graphics and interaction technologies used and developed
      - Individual Contributions
      - Challenges
      - Obstacles
      - Related work
      - Lessons learned
    - Photos
    - "Making of" documentary (2 minutes)
    - Demo Reel (30 seconds)
    - Optional PR material (logo, trailer, flyers, posters, catalog)
    - User testimonials (what did people say)
  - Look at pages from previous years! AGI15 and AGI14.
Grading Criteria

1. F = Projects do not work, no deliverables, no demos
2. E = Code, Effort, Deliverables, projects partially work
3. D = E + projects work smoothly, excellent deliverables and demos
4. C = D + Advanced Interaction OR Advanced Graphics
5. B = C + Advanced Interaction AND Advanced Graphics
6. A = B + clear individual contribution towards advanced graphics or advanced interaction
Next Class

- Friday, Sept 2
  - 8:15 – 12:00
- AGI14 and AGI15 projects
- Form groups
- Brainstorm
- Discuss
- Propose drafts
Further Reading

Advanced Methods in Computer Graphics With examples in OpenGL
Ramakrishnan. Mukundan
2012
Online [link](#)

New trends on human-computer interaction: research, development, new tools and methods
Macías, José A ; Granollers, Toni ; Latorre, Pedro
2009 2nd Printing.
Online [link](#)
Resources

• ACM SIGGRAPH
• ACM CHI
• ASSETS: ACM International Conference on Computers and Accessibility
• CSCW: ACM conference on Computer Supported Cooperative Work
• DIS: ACM conference on Designing Interactive Systems
• ECSCW: European Conference on Computer-Supported Cooperative Work: ACM conference on supporting group work
• HRI: ACM/IEEE International Conference on Human–robot interaction
• ICMI: International Conference on Multimodal Interfaces
• ITS: ACM conference on Interactive Tabletops
• and Surfaces
• IUI: International Conference on Intelligent User Interfaces
• MobileHCI: International Conference on Human–Computer Interaction with Mobile Devices and Services
• NIME: International Conference on New Interfaces for Musical Expression
  Ubicomp: International Conference on Ubiquitous computing
• UIST: ACM Symposium on User Interface Software and Technology
• i-USER: International Conference on User Science and Engineering
Thank you!

Questions

marior@kth.se
Advanced Graphics and Interaction

High-Quality Ambient Occlusion
Volumetric Light Scattering
Shadow Maps
Multi-Texturing Techniques
Cloth simulation
Soft Bodies
Fluids
Smoke
Rigged body animation
Rigid Body simulation
Multiple specular reflections and refractions
Shading techniques
N-body simulation
Generating Complex Procedural Terrains
Animated Crowd Rendering
Collision detection
Hair
Snow

Clouds
Geometric texturing
Voxels - texturing - modeling - animation
Octree rendering
Volumetric shadows
GPU Ray Tracing of large scenes with shadows, reflections and ambient occlusion

Virtual Reality
Augmented Reality
See-through HUDs
Embodiment
Kinect
Wii motes
Multi platforms
4k screen - touch
Haptics
Mobile interaction
3D printing
Microsoft surface
PixelSense
Touch screens
Gestures
Accelerometers
On-body sensing
Sonification

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