INTRODUCTION TO
COMPUTER GRAPHICS AND
INTERACTION

PROJECTS

Christopher Peters
HPCViz, KTH Royal Institute of Technology, Sweden
chpeters@kth.se
http://kth.academia.edu/ChristopherEdwardPeters
Projects

• Groups of 1 to 3
• Must meet course learning objectives!
• Specification
  – It is up to you to specify your project
  – I will provide feedback
  – Better specification = better feedback
Purpose

Projects:

• Give you **freedom** (and difficulties) of defining your own goals
• Give you **responsibility** expected for Master's level research and beyond
• Give you a **deliverable** at the end of the course
• Demonstrate...
From this...
To this...
Remember
Projects

• Should relate to:
  – Computer graphics and animation

• Components:
  – Specification
  – Implementation
  – Report
  – Blog
  – Video demo (ideally narrated)
    – Unity Web-player
Blogs

Project blogs from previous students

http://graphics-project-dh2323.blogspot.se/2014

https://portfolio-mskhan.rhcloud.com/my-custom-shader/

Conducted in DGI14 DH2323
Have no idea about where to begin?
Project Theme: Virtual KTH
A Typical Chain

2D paint package

3D modelling package

Real-time engine

2D textures

3D models and animations

Real-time rendering, animation and interaction

Christopher Peters

chpeters@kth.se
Basic Generic Project

1. Choose an area / object in KTH

See other project blogs (DH2323 KTH Social)
Set up your own blog with your spec. as first entry and screenshot
Basic Generic Project

1. Choose an area / object in KTH

2. Take some photos of it to create a texture library using 2D graphics tools
   GIMP, Photoshop, Paint.net

   Resize, apply tiling, remove perspective and lighting, clean-up
Basic Generic Project

1. Choose an area / object in KTH

2. Take some photos of it to create a texture library using 2D graphics tools
   GIMP, Photoshop, Paint.net

3. Model the object/area in a 3D modelling package
   Blender, Maya or 3DS Max

Ensure model compatibility with real-time graphics requirements
Texture sizes, number of triangles, etc
Basic Generic Project

1. Choose an area / object in KTH

2. Take some photos of it to create a texture library using 2D graphics tools
   GIMP, Photoshop, Paint.net

3. Model the object/area in a 3D modelling package
   Blender, Maya or 3DS Max

4. Export as FBX into the Unity Games Engine

   Select correct export options
   Add features in Unity (lighting, displacement mapping, etc)
   Create a real-time demo (it's easy in Unity)
Other ideas

Integrate existing content together
  Many building models and other content
  Needs to be integrated into a single scene

Improve previous projects
  Add newer models or better special effects to existing models
  Most models still do not use nice shaders
  Some of the models in the traffic simulations are simple
  Virtual characters in the pedestrians simulations are not very diverse
  Create a promotional video or media demonstration using the existing models
More Advanced Projects

Add or focus on a technical implementation

Algorithm or process

Think of the type of work you are doing in the labs

Ideally C++ libraries plugging into Unity

But you can use anything that you like

Create a shader in Unity

Three suggested collaborative projects…
#1 Expression-based Interaction

Dr. Stelios Asteriadis, University of Maastricht

User-to-user / avatar communication enhanced by affective content through facial expression recognition

Real facial expressions to be mapped onto virtual avatars (KTH)

Create a facial animation system

Learn what mappings are deemed to trigger higher emotional communications through optimization techniques
Dr. Adam Qureshi, Department of Psychology, Edge Hill University, UK

Create two virtual scenes (bar and library) in Unity

Add crowd of virtual characters

Play motion captured animations on them

Help to conduct user study (optional)
Miguel Ramos Carretero, KTH
Virtual scenes
Create crowds of animated characters
Add various audio types
Prepare the scenes in Unity
Conduct a user study
Looking for ideas?

See my project’s page:
http://www.csc.kth.se/~chpeters/projects.html

More advanced projects (usually Master’s thesis level)
But help you identify possible ideas
Next Session

Lecture:
Mathematics

08:00 – 10:00
Monday 13\textsuperscript{th} April
L1
My Advice

Over the next week:

1) Continue to work on the labs
2) Look in more detail at all the previous blogs
3) Download Unity 3d
4) Do some web tutorials
5) Search around the Unity site and for Unity demos on Youtube