



ROYAL INSTITUTE
OF TECHNOLOGY

DH2323 DGI15

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

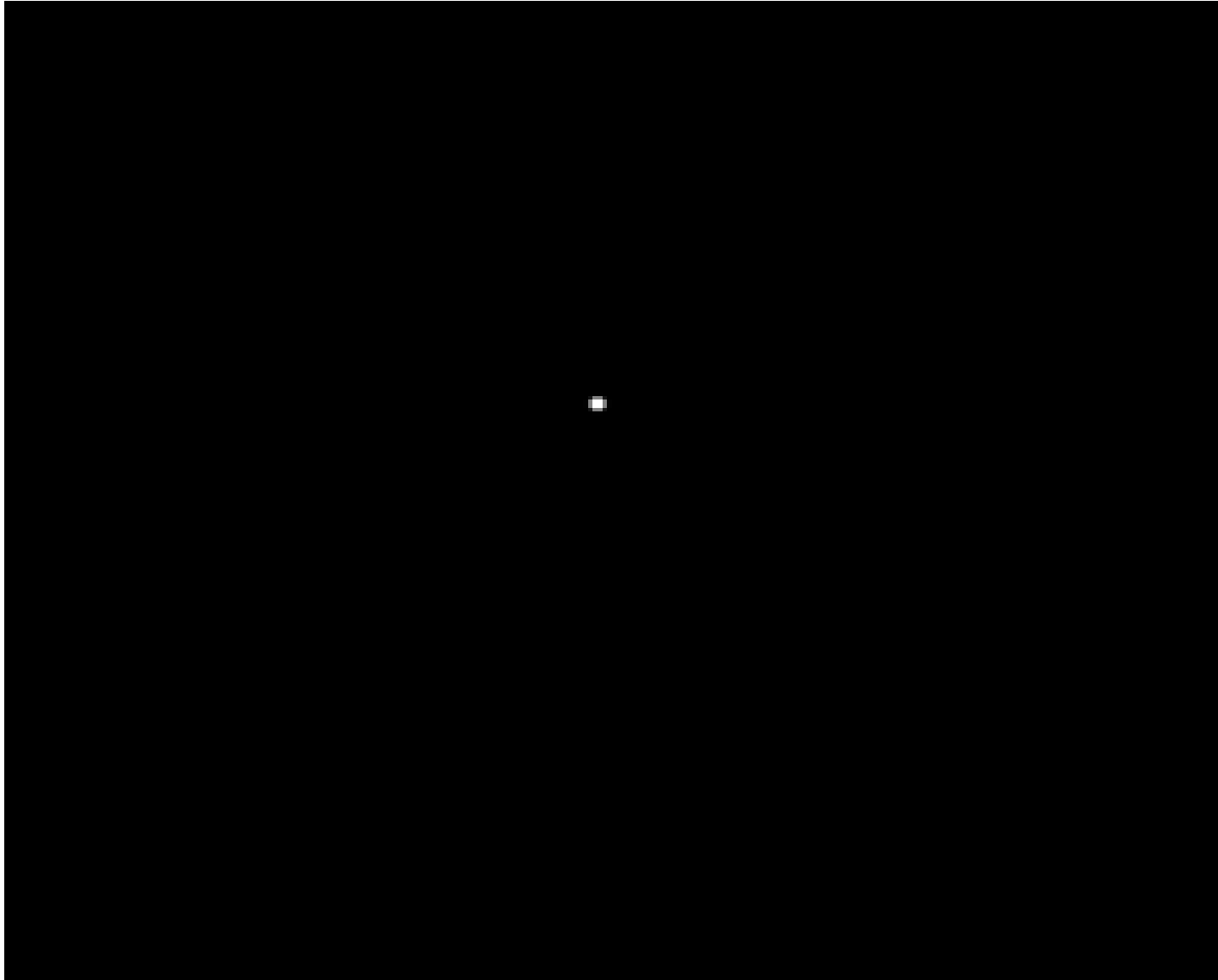
- Groups of 1 to 3
- Must meet course learning objectives!
- Specification
 - It is up to you to specify your project
 - I will provide feedback
 - Better specification = better feedback

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...



ARMA 3, Bohemia Interactive

Remember



ARMA 3, Bohemia Interactive

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



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

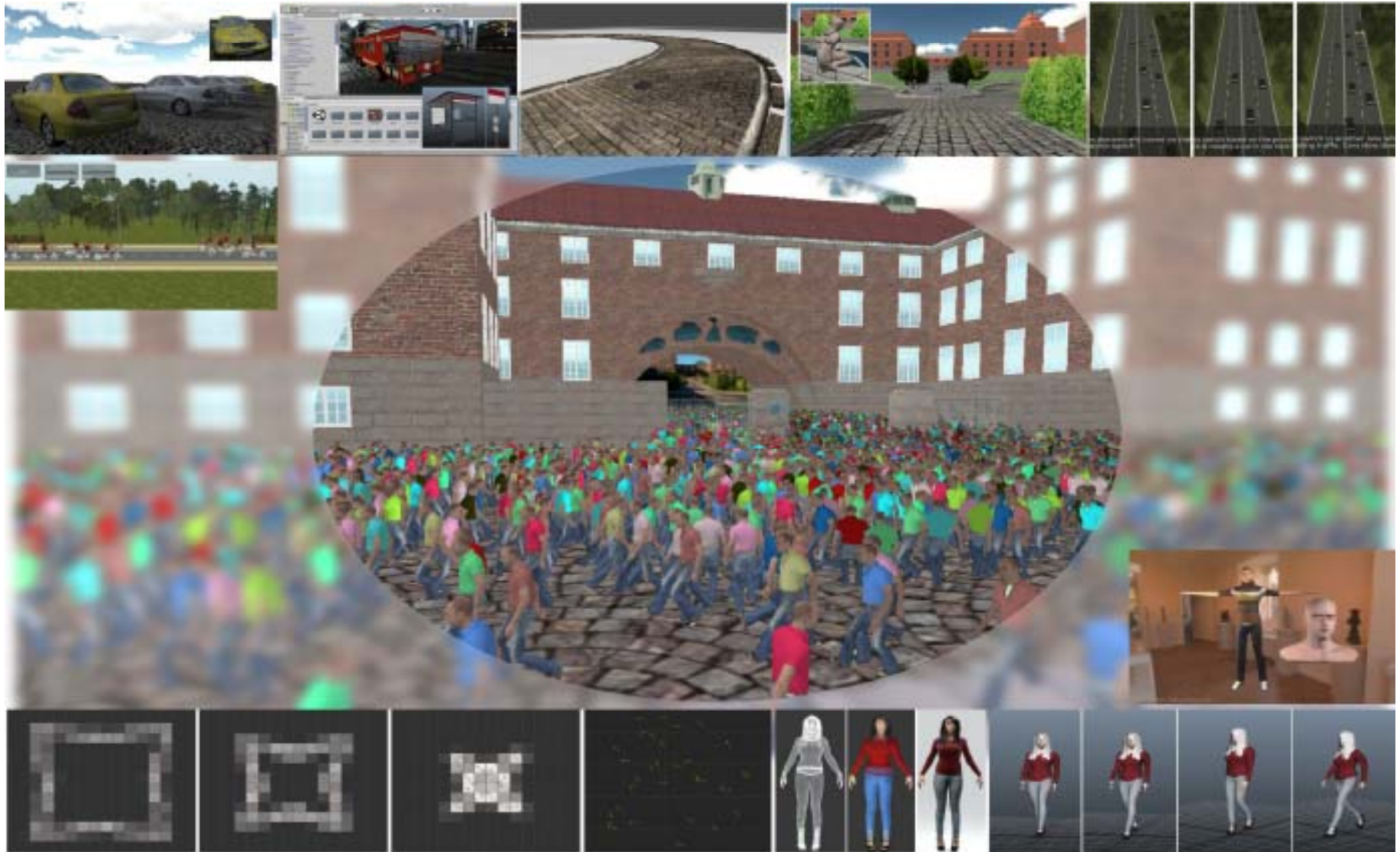


<http://graphics-project-dh2323.blogspot.se/2014>

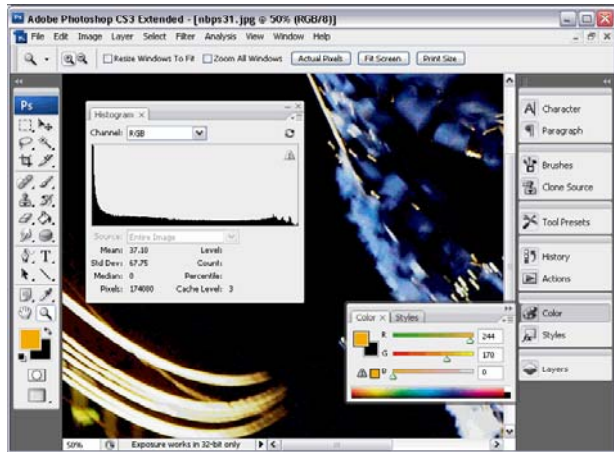
Conducted in DGI14 DH2323

Have no idea about where to begin?

Project Theme: Virtual KTH



A Typical Chain



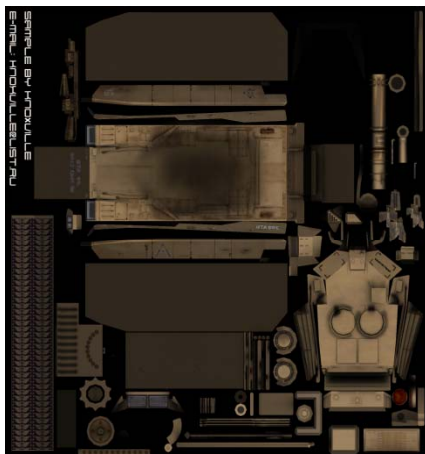
2D paint package



3D modelling package



Real-time engine



2D textures



3D models and animations



Real-time rendering, animation and interaction

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

#2 Scenario Creation for Experiment

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)



#3 Setup and Conduct User Study



Miguel Ramos Carretero, KTH
Virtual scenes

Create crowds of animated
characters

Add various audio types

Prepare the scenes in Unity

Conduct a user study



ROYAL INSTITUTE
OF TECHNOLOGY

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



ROYAL INSTITUTE
OF TECHNOLOGY

Next Session

Lecture: **Mathematics**

08:00 – 10:00

Monday 13th 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