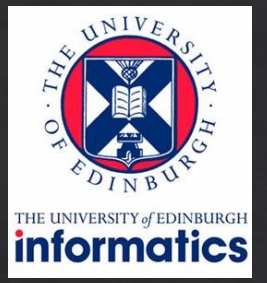


Computer Graphics: Rendering

Autumn 2024

Lecture 1: Introduction and Course Organisation

Kartic Subr

Me: A brief history

Univ. of Edinburgh | Heriot Watt Univ. | Univ. College London | INRIA-Grenoble | Univ. of California Irvine | Bangalore Univ.

2016 ← 2001

Disney Research

NVIDIA

R&H

hp

Important Looking Pirates VFX

Special Effects

Video Games (real-time)

God of War: Ragnarok 2023

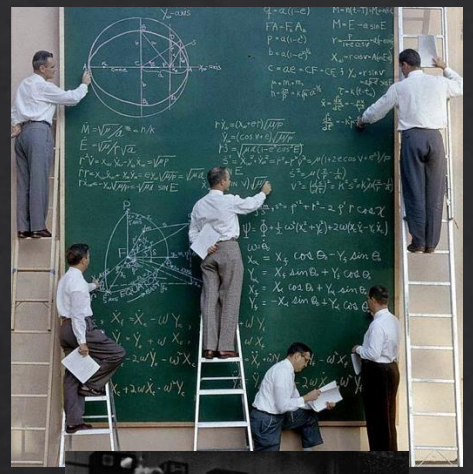
THE UNIVERSITY of EDINBURGH
informatics

robotics
protein design
machine learning
computer graphics
genomics
approximate physics

TAG
Timely Approximations Group







robotics

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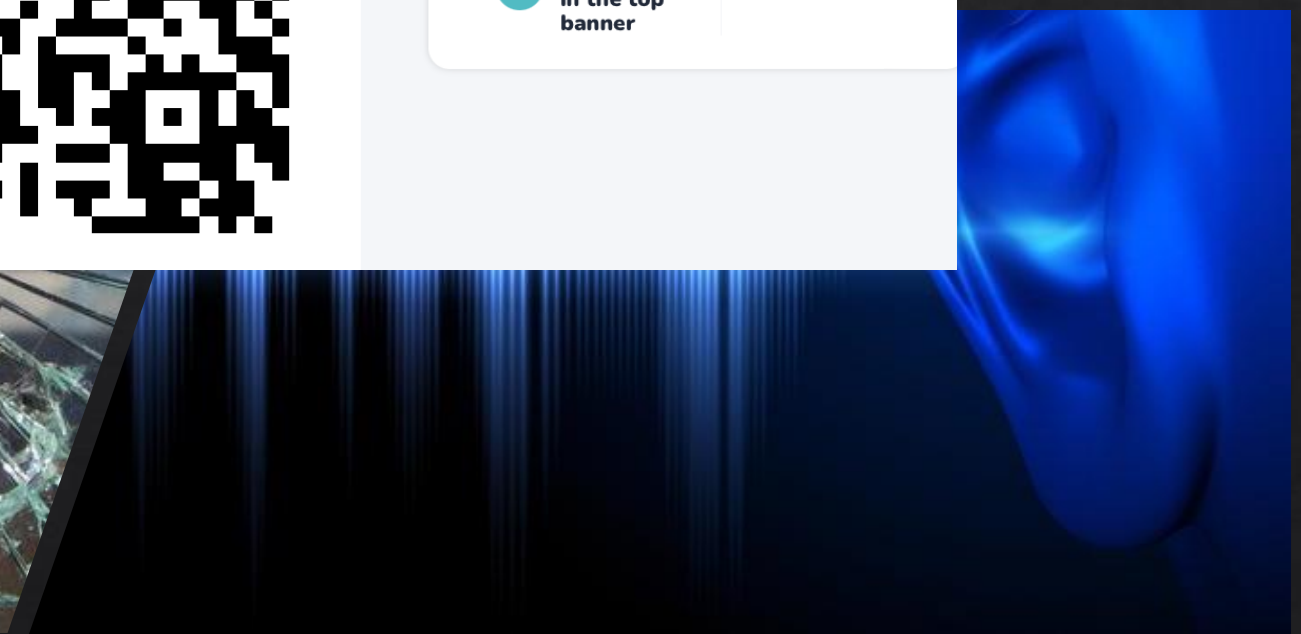
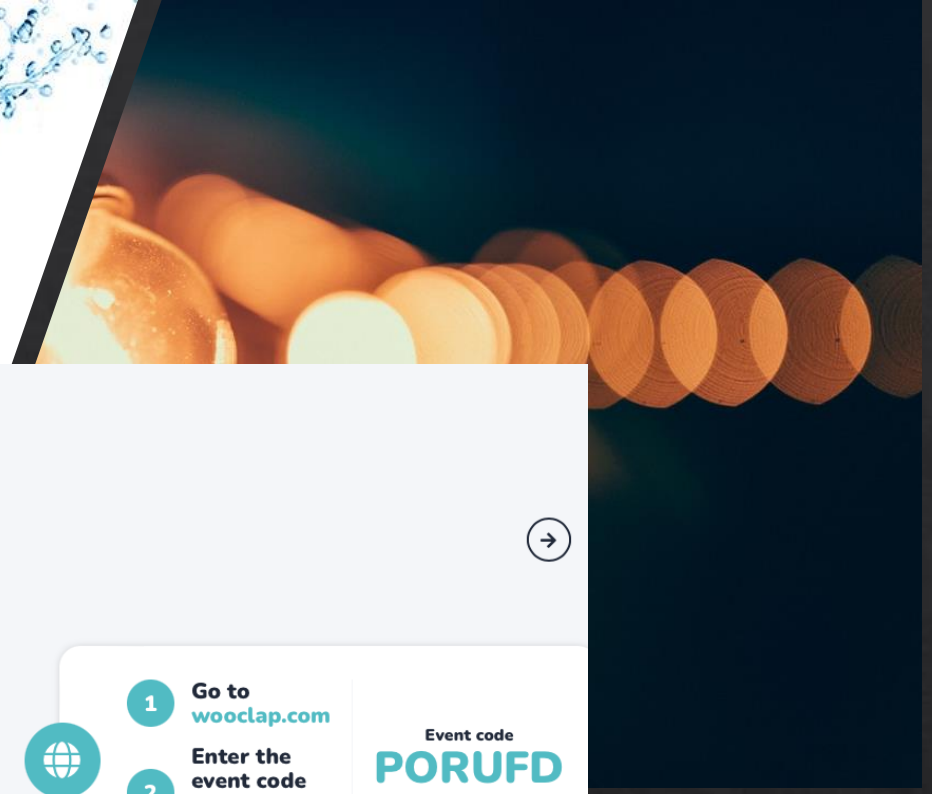
#TAG

Timely Approximations Group

THE UNIVERSITY of EDINBURGH

informatics



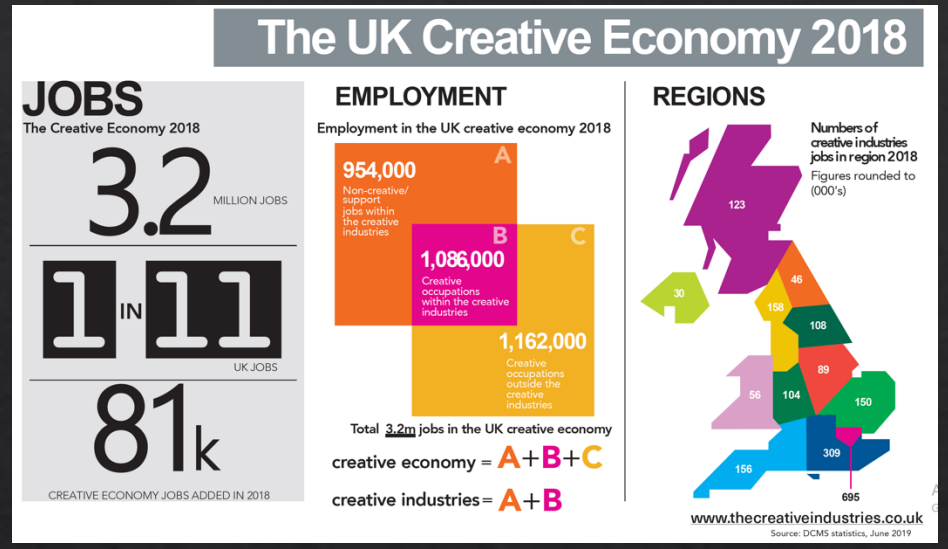


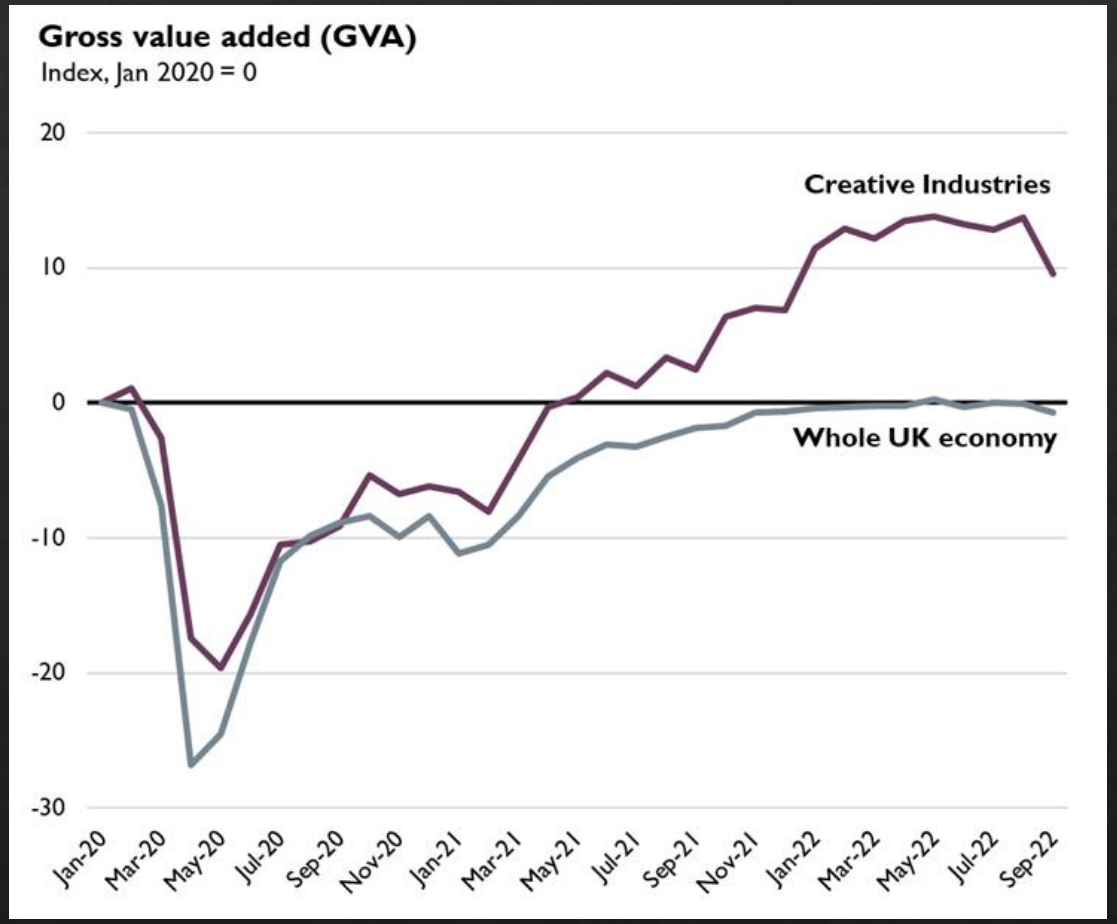
1 Go to wooclap.com

2 Enter the event code in the top banner

Event code
PORUFD

Creative Industries in the UK





https://lordslibrary.parliament.uk/arts-and-creative-industries-the-case-for-a-strategy/

CGR is central to the creative industries

The creative industries contributed £124.6bn in 2022, accounting for 5.7% of UK GVA. The GVA of creative industries grew by 6.8% between 2021 and 2022 leaving it 12.2% higher than pre-pandemic (2019) and 50.3% higher than in 2010, in real terms.

Source: DCMS report 2024

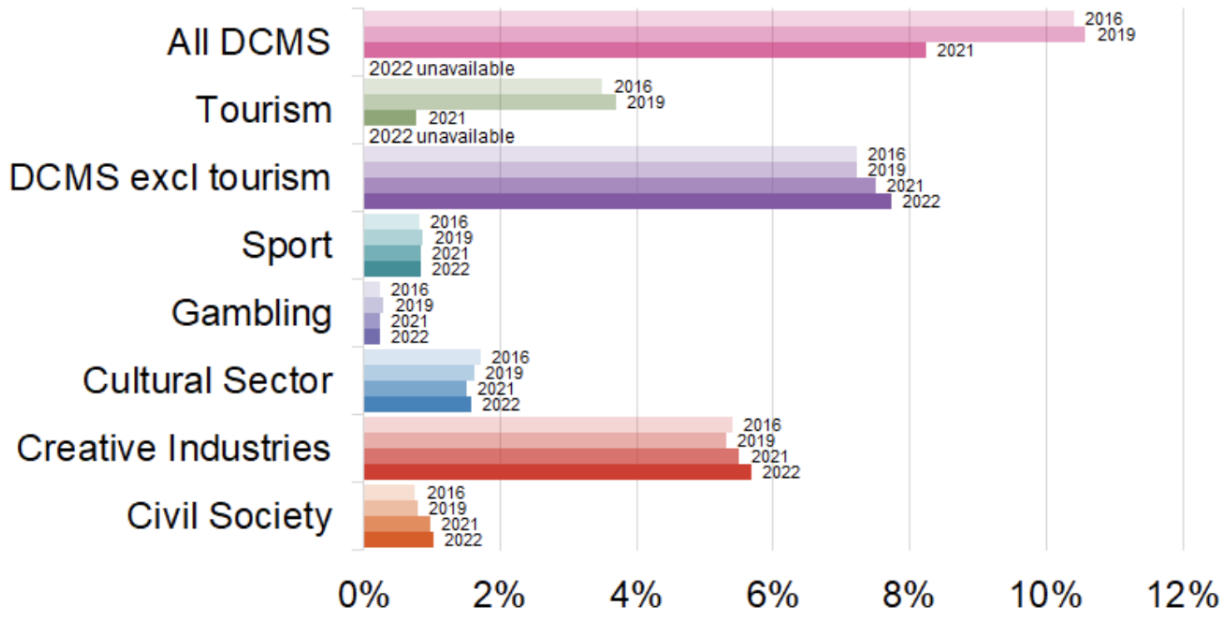
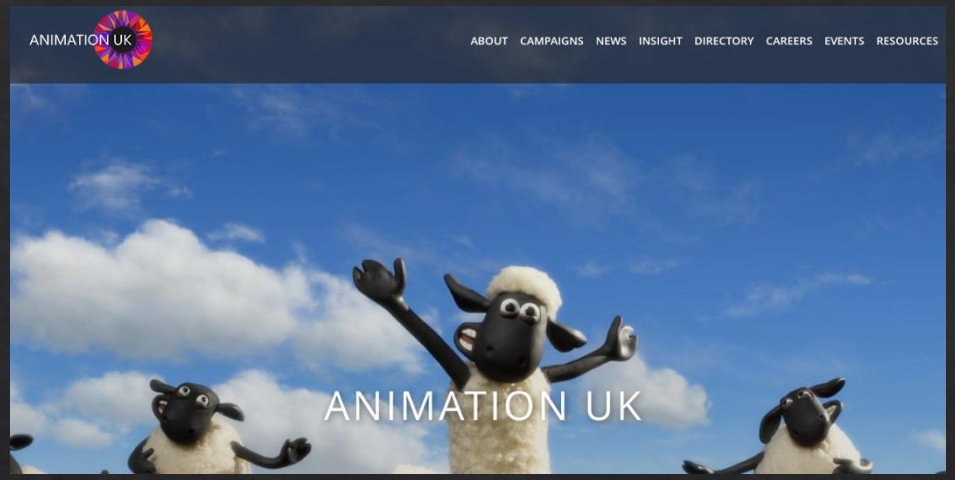
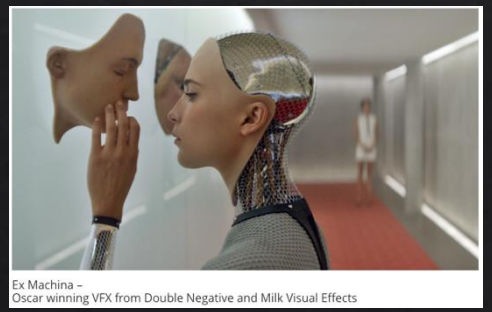


Figure 1. Comparison of GVA in DCMS sectors for selected years, as a proportion of the whole UK economy (current prices)

It’s all happening here in the UK!




Gravity: VFX by Framestore


Ex Machina –
Oscar winning VFX from Double Negative and Milk Visual Effects


Guardians of the Galaxy 2: Marvel – VFX by Framestore


The Crown – Netflix: VFX by One of Us

Simulating photorealistic pictures?

photograph

Colourbox.com

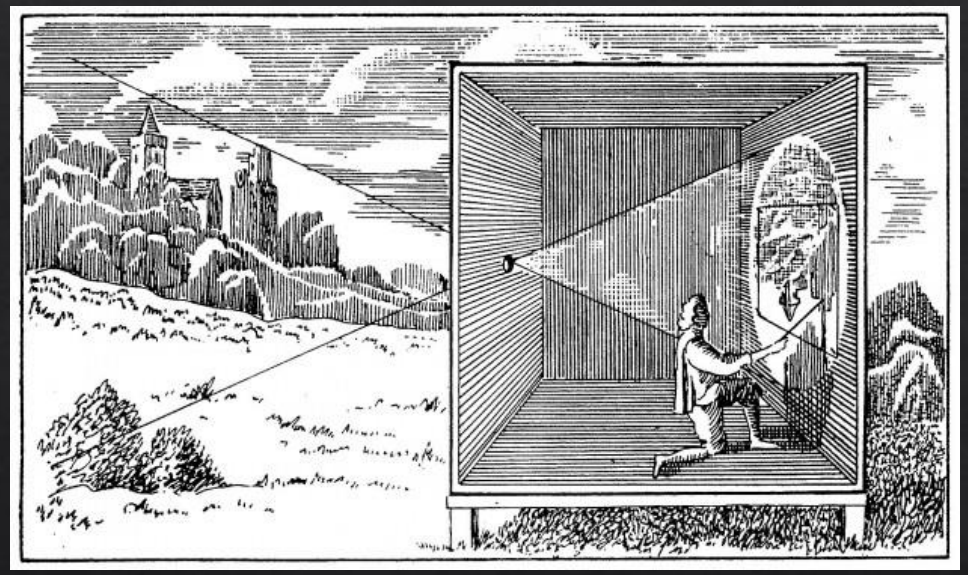
manually painted

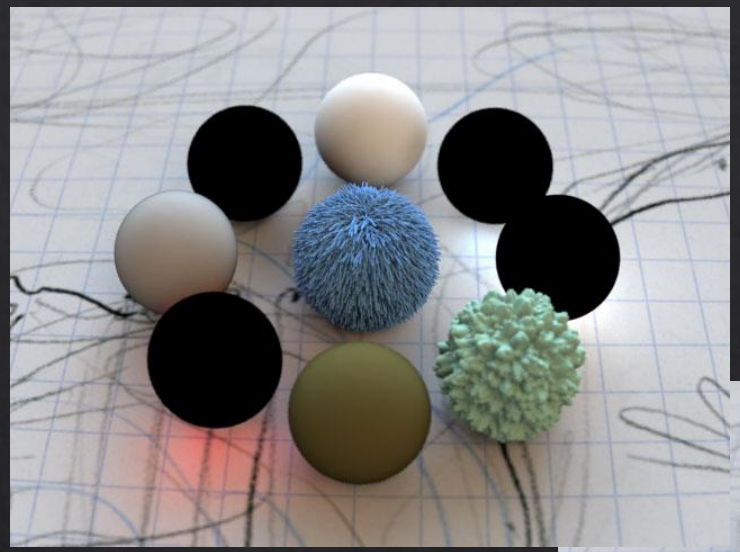
Pedro Campos

computer generated

Physically based simulation, at its core!

Projective geometry



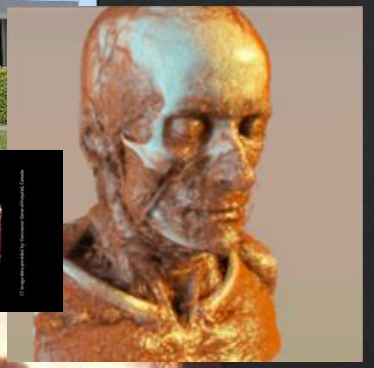


Energy
(light transport)

Advertising

Engineering

Medicine



Defense

Entertainment

Simulate the physics of light

lenses

defocus

exposure time

materials

light, media

About the course …

- coursework only (no exam)

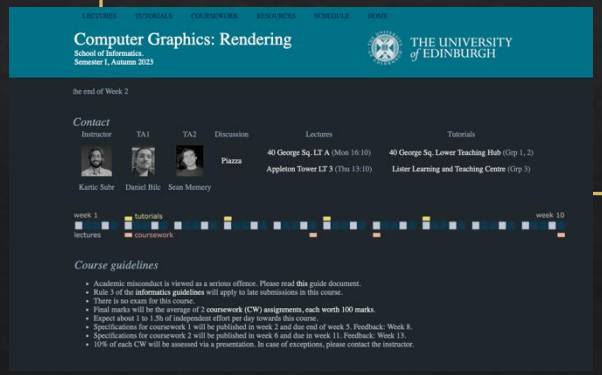
- 2 coursework assignments: C1, C2
  - Final mark = C1 + C2

- class split into 3 groups (for tutorials)
  - Tutorials provide guidance towards CW

- GPT, co-pilot, Edinburgh University's ELM (click here)

Logistics

TA and marker: Krzyzstof Gyrkiel
(took the course last year)



[Course website](https://ksubr.github.io/CGR2024/)

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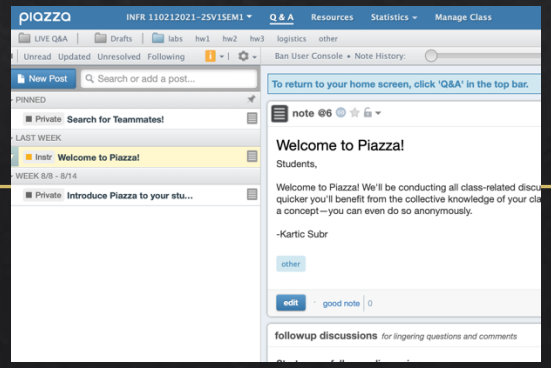
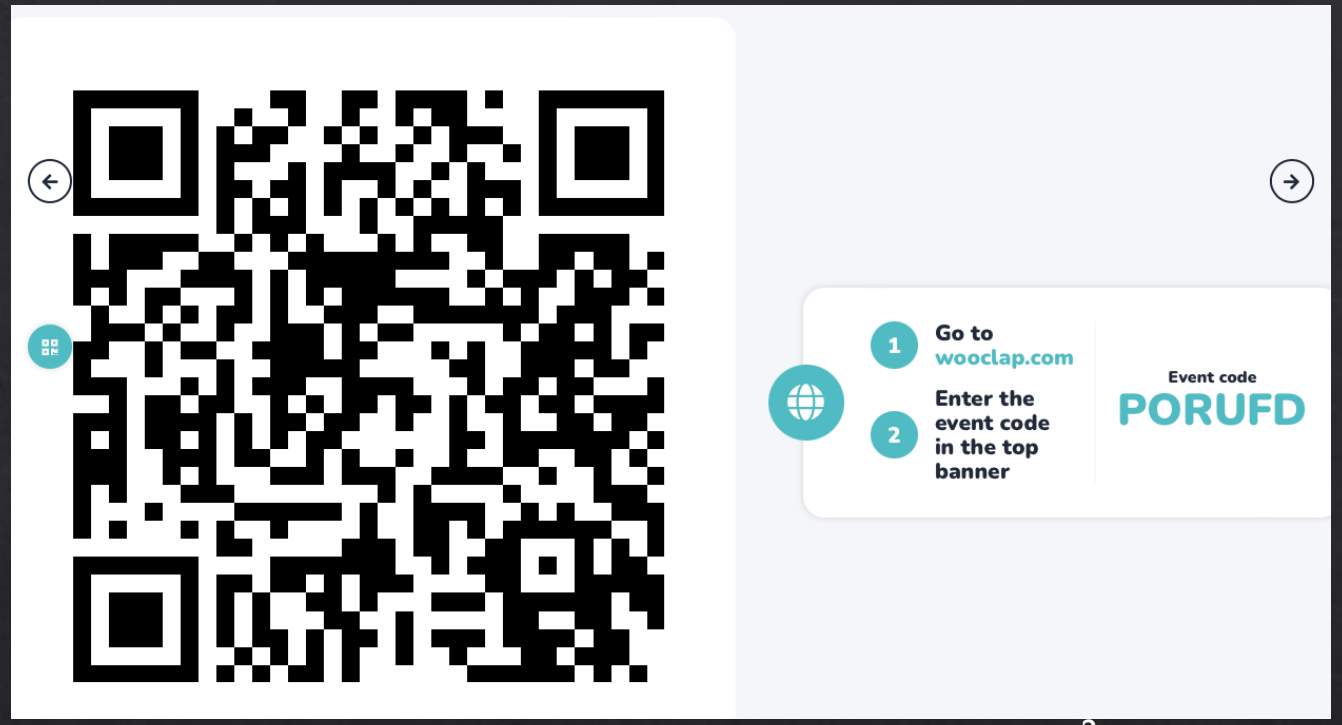


piazza



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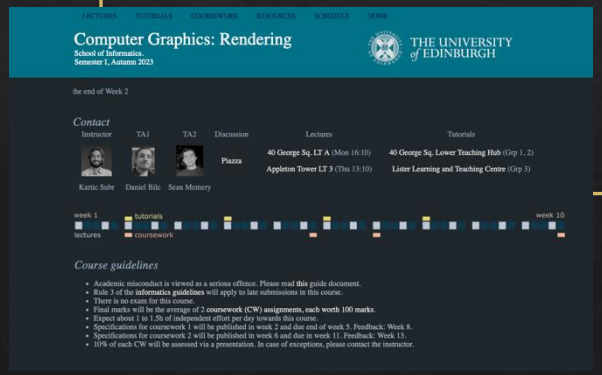
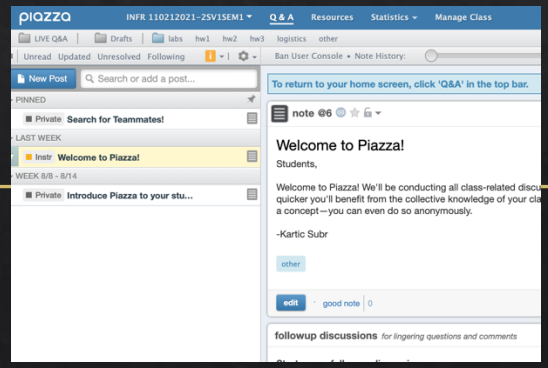


[Course website](#)

https://ksubr.github.io/CGR2023/



piazza

CGR

- Contact hours (19h)
  - 16h lectures
  - 3h tutorials

- Self-directed (80h)
  - 6h creative thinking
  - 37h CW1 (for 80%)
  - 37h CW2 (for 70%)

CGR

- Contact hours (19h)
  - 16h lectures
  - 3h tutorials

- Self-directed (80h
  - 6h creative thi ng
  - 37h CW1 (for 80%)
  - 37h CW2 (for 70%)

Main feedback/criticism previous offerings

- CW1 worth too much credit
- CW2: basic ray tracing took too long
- CW2 timing not ideal (other coursework)
- Use of Gen AI tools should not be compulsory
- Much of lecture material is not applied or assessed

Comments …

At the start of the semester, I was quite intimidated by this course as I did not have much experience in computer graphics nor C++, and I was worried I would not be able to complete the coursework. However, I was pleasantly surprised by how much I was able to complete, and even genuinely enjoy the process of doing the coursework. I used to be intimidated by C++, but completing a non-trivial program (albeit with the help of AI tools) helped me gain confidence and experience working with C++. Blender is also an interesting tool that I am

[2023-24]: "Kartic has delivered what turned out to be my favourite course in my 7 semesters of learning at the University of Edinburgh. The material was well put together and delivered in a way that kept me engaged throughout the whole duration of the lecture. He was also always willing to stay after the lecture to talk more about the subjects with interested students - something that I was happy to

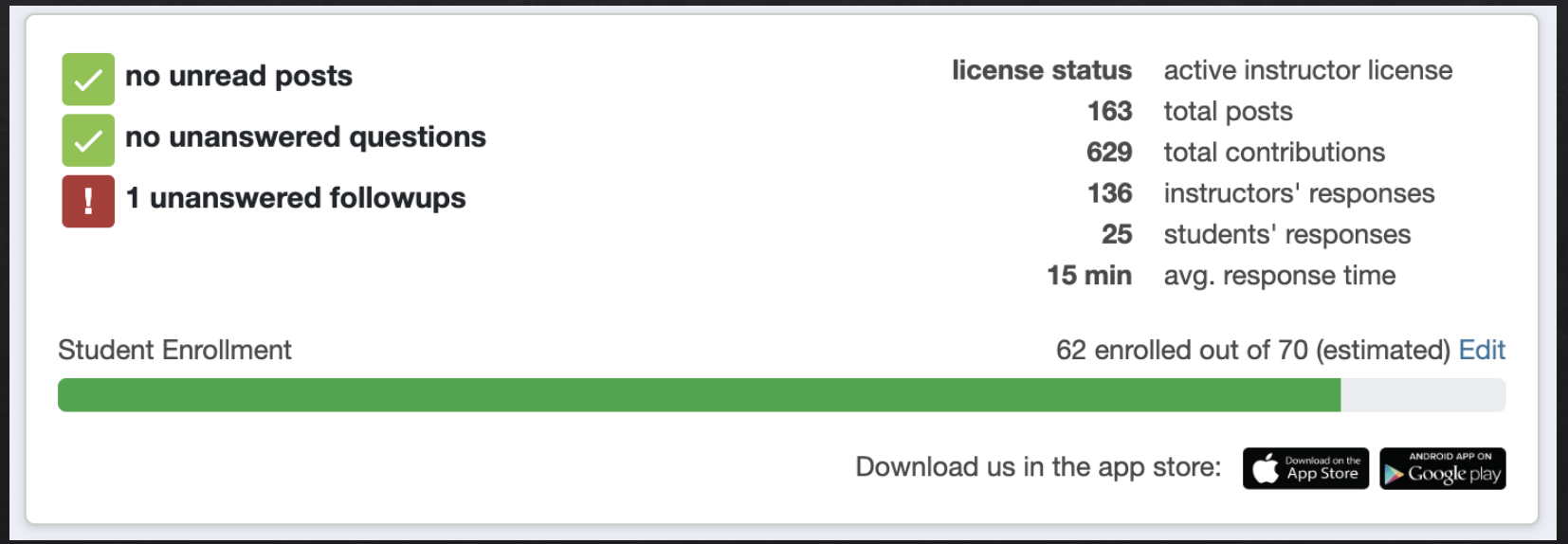
- **Student GMQa**: I enjoyed the topics covered in the lectures, it was all interesting and Kartic is a great lecturer, however the 2nd coursework ruined the whole semester for me because of how difficult it was (for 2 weeks straight I was waking up to do CG and going to sleep after doing CG, with just CG in between). The idea of building a raytracer is great but terribly executed, please reconsider it for the next year so that it is possible to complete it while also being able to do other courses!
- **Student mxPC**: Dr Subr is passionate about the subject matter and most importantly - and excellent lecturer & teacher. The TA is also a wonderful.

The tutorial sessions were one of the most fruitful learning experiences I had. In particular, the tutorials for CW2 were simple but effective at helping me to plan ahead for the coursework, and were the main reason I could attempt the advanced features in CW2. It's a shame that tutorial attendance was so low. I started CW2 very early (within hours of its release), which meant that when I attended the second tutorial, I was in a good place to discuss the advanced

This course is easily my favourite course this semester in Edinburgh, and quite possibly my second favourite course in my 3.5 years of undergraduate studies thus far. (Top spot is

Top tips

- Try to attend as many lectures as possible in-person
- Work regularly – not just before deadlines
- Use your opportunity to interact with the instructor



Last year