

Computer Graphics: Rendering

Autumn 2024

Lecture 1: Introduction and Course Organisation

Kartic Subr

Me: A brief history



Univ. of Edinburgh

2016



Heriot Watt Univ.



Univ. College London



INRIA-Grenoble



Univ. of California Irvine



Bangalore Univ.



2001





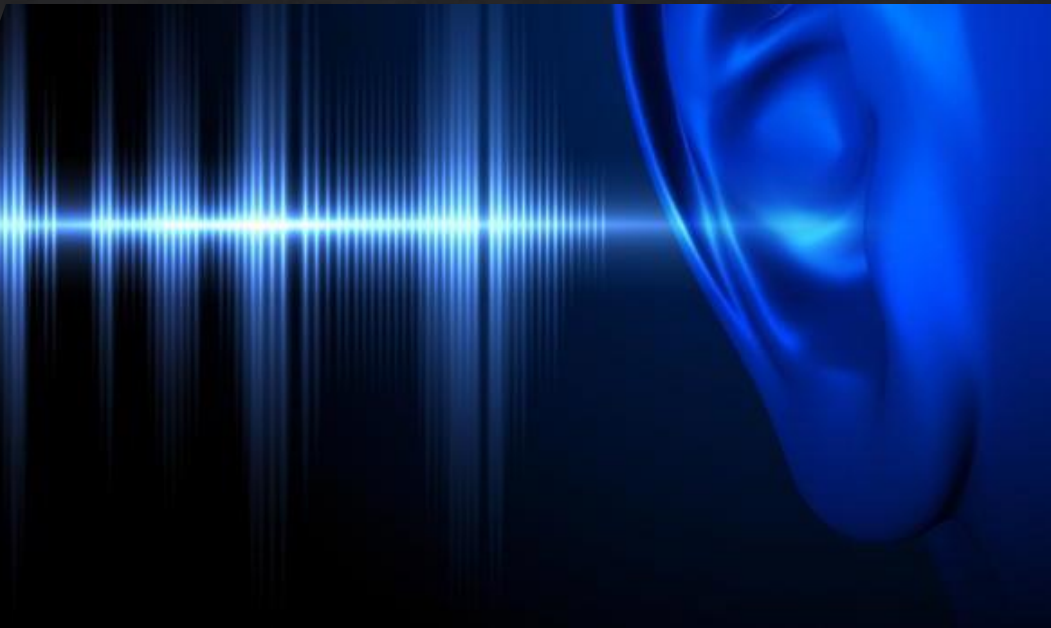
Important Looking Pirates VFX

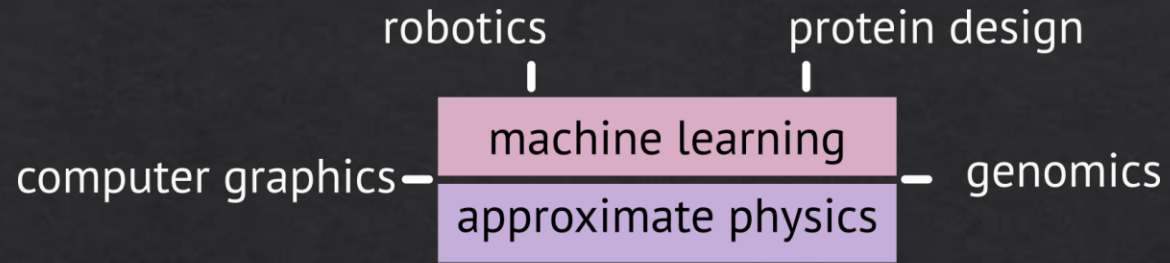
Special Effects

Video Games (real-time)



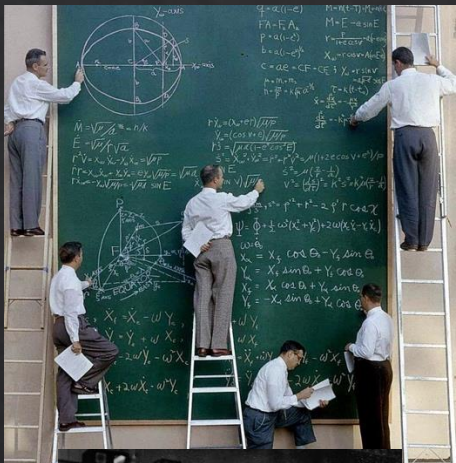
God of War: Ragnarok 2023





Timely Approximations Group





robotics

protein design

machine learning

computer graphics

genomics

approximate physics



#TAG
Timely Approximations Group



←

QR

A large, high-contrast black and white QR code.

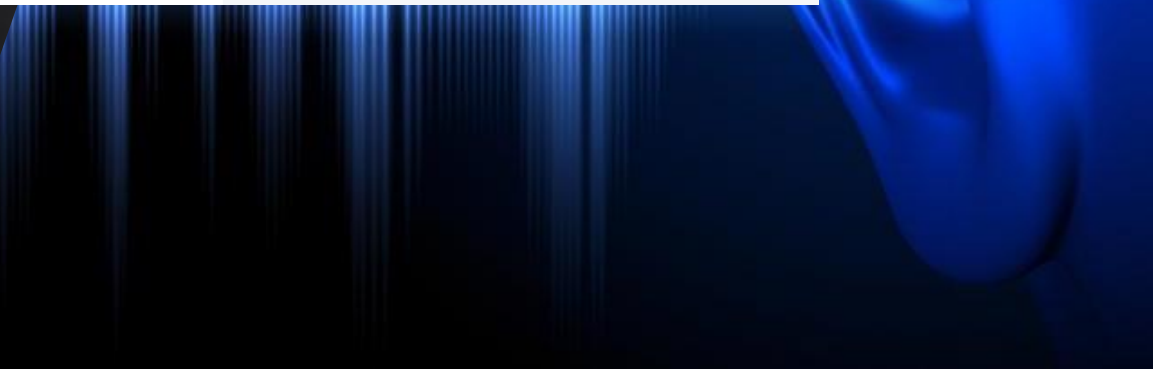
→

A teal circular icon containing a white globe.

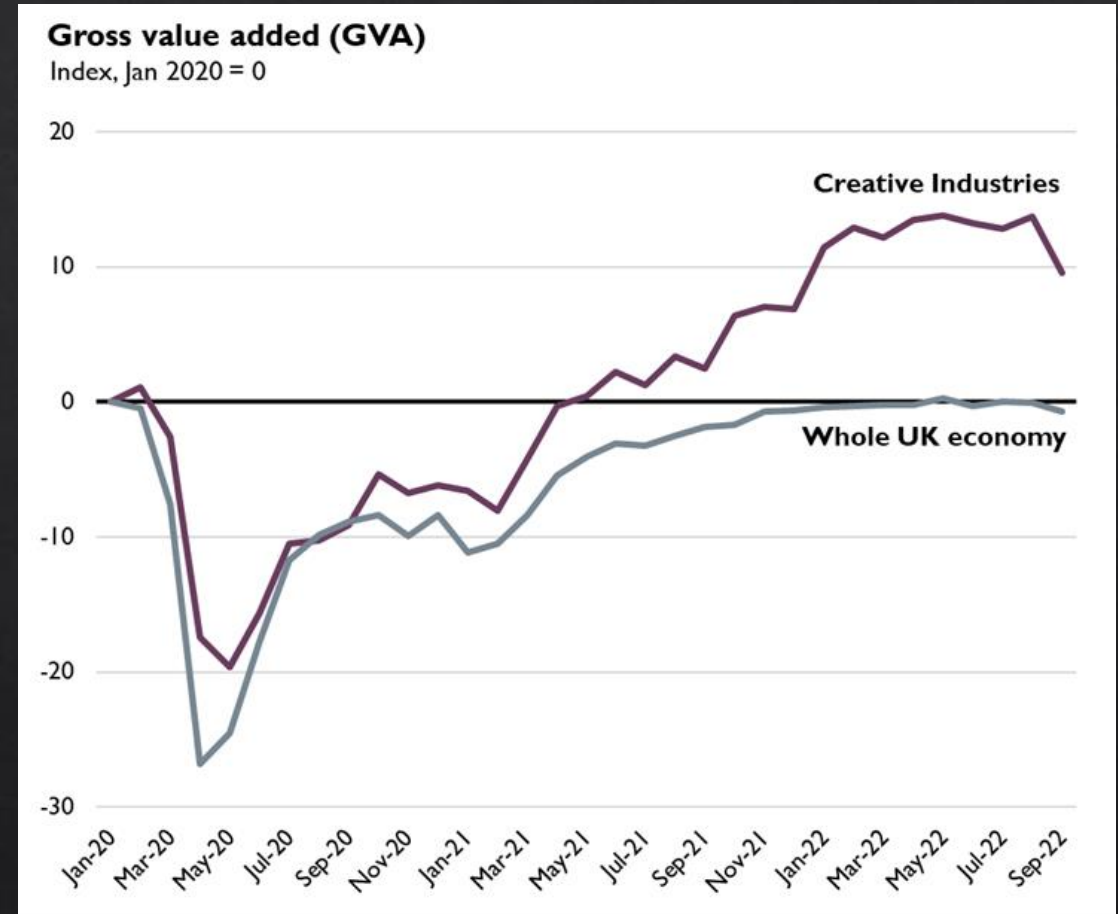
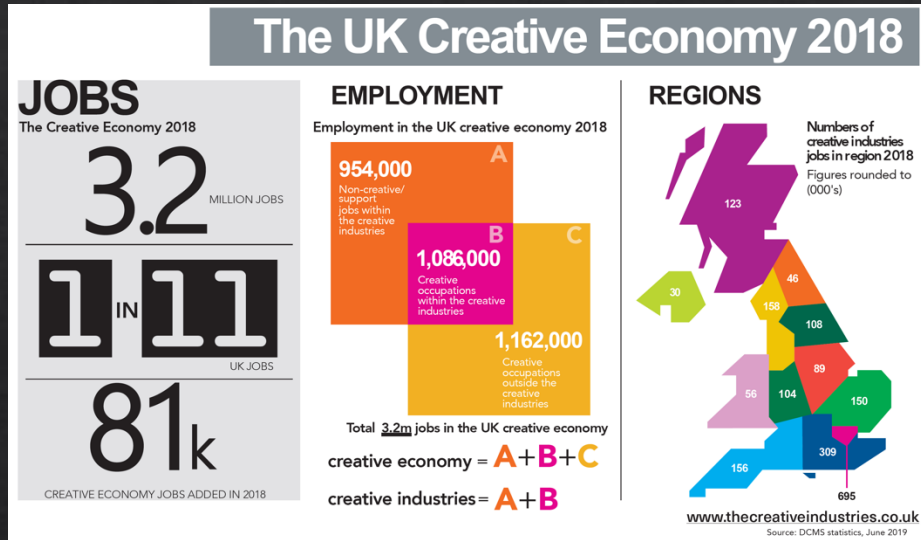
1 Go to wooclap.com

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](#)

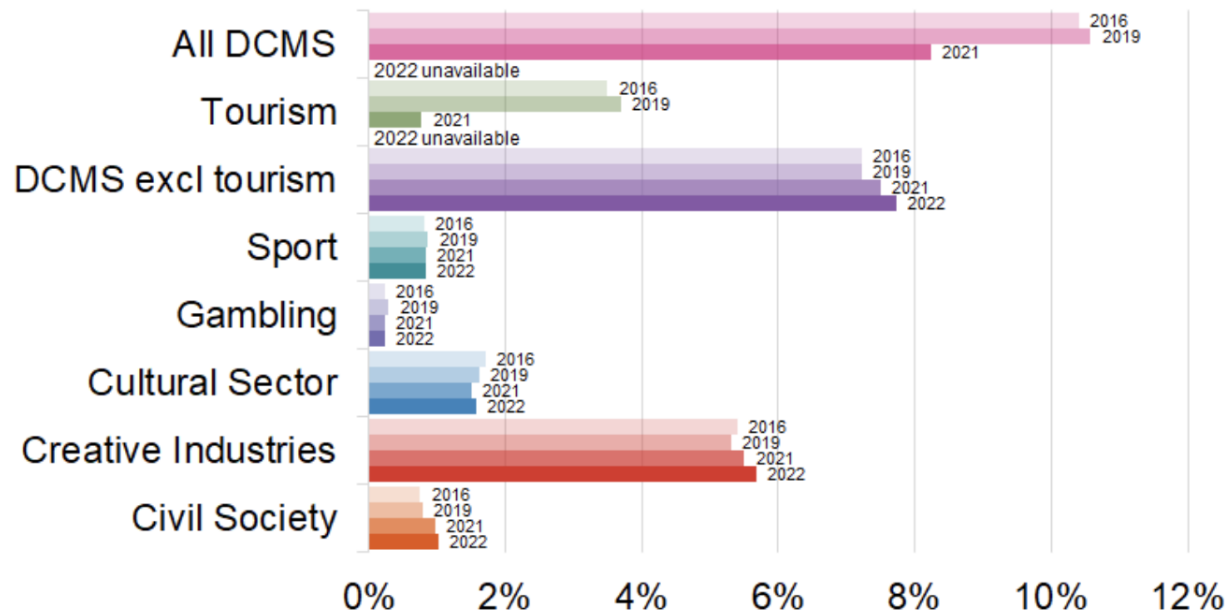
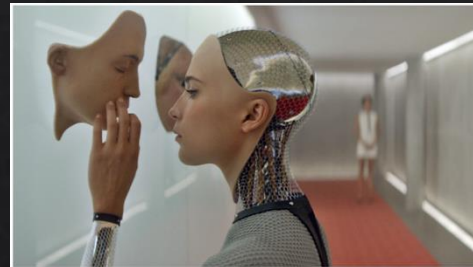
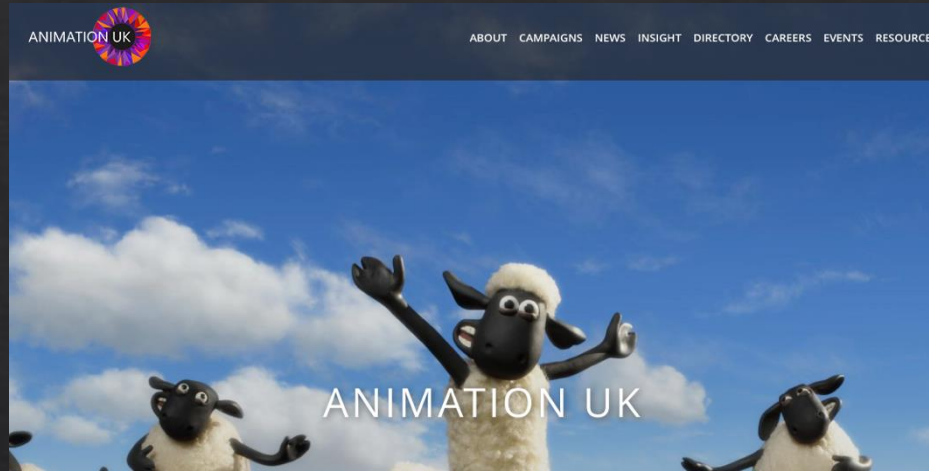


Figure 1. Comparison of GVA in DCMS sectors for selected years, as a proportion of the whole UK economy (current prices)

It's all happening here in the UK!



Simulating photorealistic pictures?

photograph



Colourbox.com

manually painted



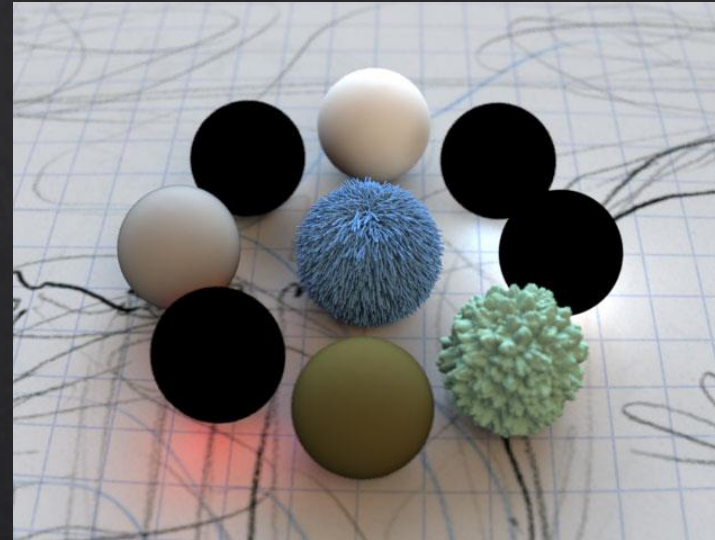
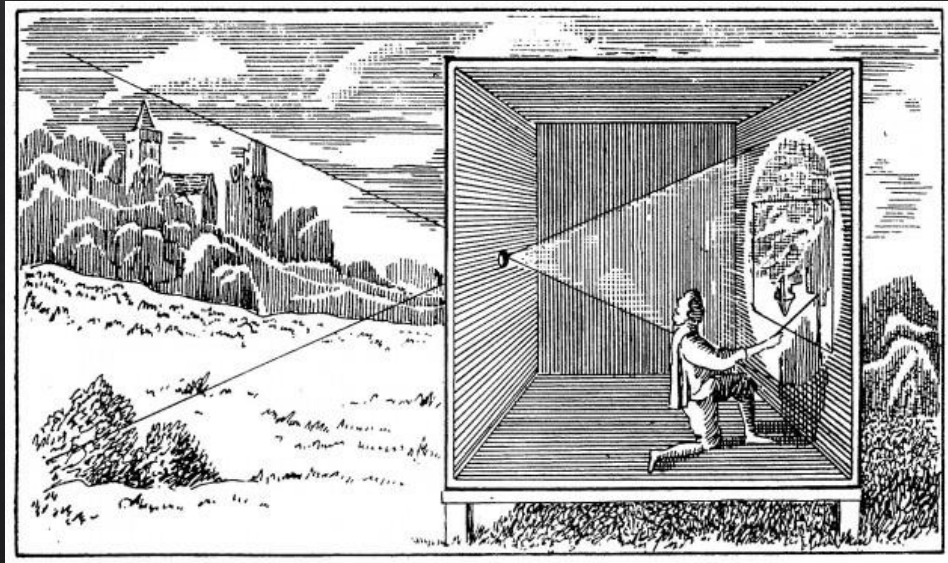
Pedro
Campos

computer generated



Physically based simulation, at its core!

Projective geometry



Energy
(light transport)



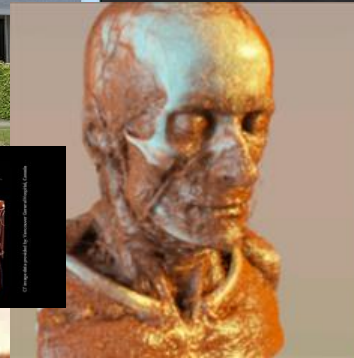
Advertising



Engineering



Medicine

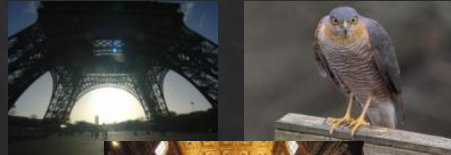


Defense



Entertainment

Simulate the physics of light



lenses



defocus



exposure time



materials



light, media

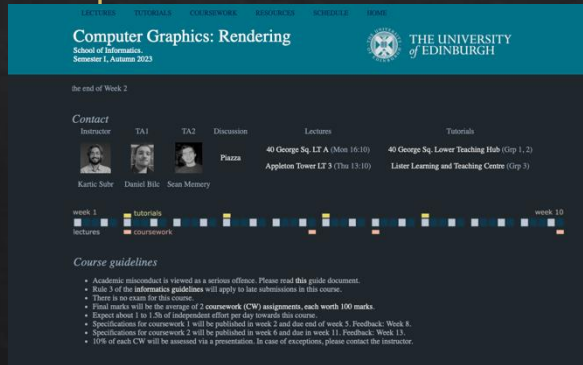
About the course ...

- 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

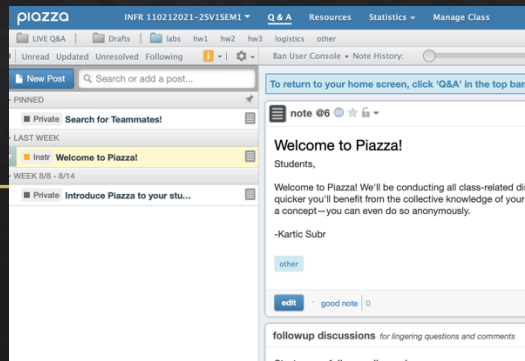


TA and marker: Krzysztof Gyrkiel
(took the course last year)



Course website

<https://ksubr.github.io/CGR2024/>




piazza





←
→

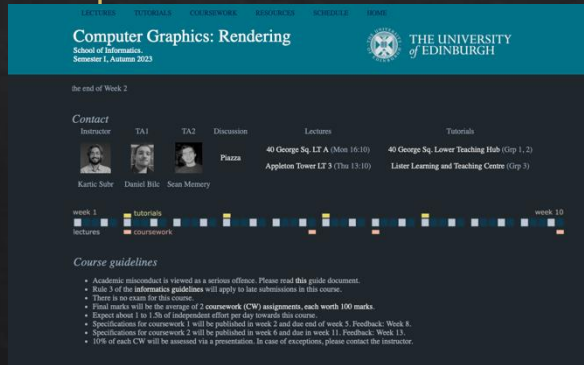


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Event code

PORUFD

?



Computer Graphics: Rendering
School of Informatics, Semester 1, Autumn 2023

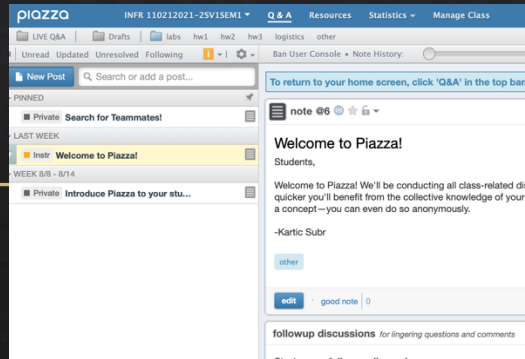
the end of Week 2

Contact

Instructor	TA1	TA2	Discussion	Lectures	Tutorials
Kartik Subr	Daniel Bile	Sean Memory	Piazza	40 George Sq, LT A (Mon 16:10) Appleton Tower LT 3 (Thu 13:10)	40 George Sq, Lower Teaching Hub (Gip 1, 2) Lister Learning and Teaching Centre (Gip 3)

Course guidelines

- Academic misconduct is viewed as a serious offence. Please read this guide document.
- Rule 3 of the informatics guidelines will apply to late submissions in this course.
- There is no exam for this course.
- Final marks will be the average of 2 coursework (CW) assignments, each worth 100 marks.
- Expect about 1 to 1.5 hrs of independent effort per day towards this course.
- Specifications for coursework 1 will be published in week 2 and due end of week 5. Feedback: Week 8.
- Specifications for coursework 2 will be published in week 6 and due in week 11. Feedback: Week 13.
- 30% of each CW will be assessed via a presentation. In case of exceptions, please contact the instructor.



piazza INFR 110212021-25V1SEM1

Unread Updated Unresolved Following

WELCOME TO PIAZZA!

Welcome to Piazza! We'll be conducting all class-related discussions quicker you'll benefit from the collective knowledge of your class—a concept—you can even do so anonymously.

-Kartik Subr



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%)

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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

 no unread posts	license status active instructor license
 no unanswered questions	163 total posts
 1 unanswered followups	629 total contributions
	136 instructors' responses
	25 students' responses
	15 min avg. response time

Student Enrollment 62 enrolled out of 70 (estimated) [Edit](#)



Download us in the app store:  

Last year