

Computer Animation

Subject area: Computer Science/ICT

University:	L'X
Level:	MA all years
Teaching mode:	Hybrid mode, EuroteQ students can attend the class fully online and asynchronously.
Instructor(s):	Damien Rohmer

Short description

This 3D Computer Animation course teaches the Computer Graphics methods related to animation and deformation of 3D shapes used in video games, special effects, and animated films, or more generally in animated and interactive virtual worlds.

Full description

<https://imagecomputing.net/damien.rohmer/teaching/inf585/index.html>

This 3D Computer Animation course teaches the computational methods for real-time animation and deformation of 3D shapes used in video games, special effects, and animated films, or more generally in animated and interactive virtual worlds. The course details geometric-based animation approaches such as procedural animation, manual 3D deformers, and character animation, as well as physically-based simulation for particle systems, cloth and fluid simulation.

The applications illustrated throughout the class will be mostly related to the field of entertainment (animated films, video games, virtual and/or augmented reality), or real-time simulation for modeling physical phenomena. The underlying mechanisms can further be applied in other scientific disciplines (medical sciences, biology, etc.).

Examples of cases treated in the lectures and practical exercises: Implementing animation and interactive deformation of an articulated character, Modeling the deformation of a garment and managing collisions in real time, Simulating the surface of a moving fluid, Managing crowds of characters moving coherently, etc.

Learning outcomes

Knowledge of the industry-standard methods for real-time and interactive animation methods for VFX, animation cinema, and video games, as well as research oriented approaches. Fundamentals of physically-based simulation as well as advanced particle-based methods. Being able to implement in C++/OpenGL several of these methods in an interactive context.

General information

Contact hours per week:	4 hours
Total workload:	36h (9 classes of 4h each) + personal work (in student hours for the whole course)
ECTS credits:	5
Language:	English

Course start date: 03 January 2023

Course end date: 17 March 2023

Add. info about start date:

Weekly teaching day/time: Tuesday 2pm-6pm (can be followed asynchronously online)

Time zone: CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)

Further information: The lab class can run on any OS (Windows, MacOS, Linux). However, students (especially if following remotely) are expected to have a sufficiently powerful personal computer to handle 3D game-like applications for the programming lab class and the project: Dedicated Graphics card is helpful; while using tablet or ultra-thin weak/old laptops is discouraged. You must also have sufficiently available memory RAM and disk space to run and install a C++ compiler such as Visual Studio if you are on Windows. Students with MacOS will be expected to be autonomous with handling and setting up their system.

Prerequisites: Students are expected to be familiar with C++ programming, and independent to handle installation and compilation on their machine - all assignment will take place in C++, and use OpenGL.

Activities and methods: Lectures, Practices, Lectures (50%) + Computer Programming Lab Class (50%)

Presence on campus: no

Final examination

Form: Online test, practical assignment and final project.

Date:

Location/format: no final examination set up

Re-sit possibility: yes

Transcript available: end of the semester and generally 8 weeks after the exam.

Add. info/requirements:

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	6
Minimum participants:	
Internal course code:	INF585
Contact:	euroteq-mobility@polytechnique.fr

This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.