

Introduction to Computer Graphics

Tobias Isenberg

Overview

Computer Graphics is Dead!



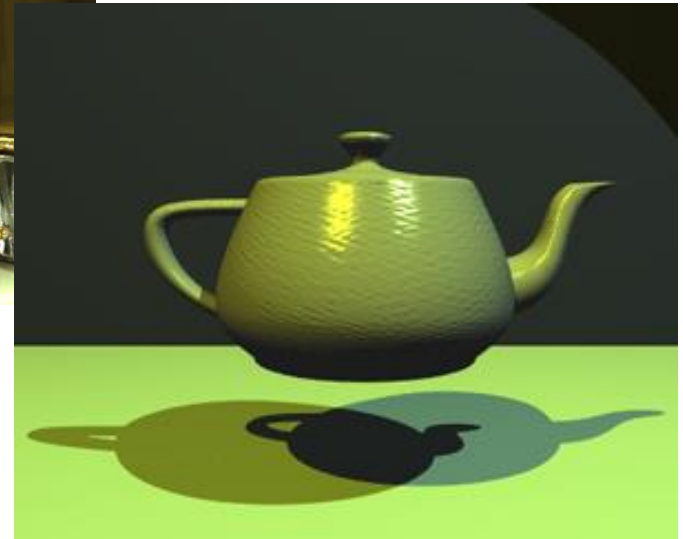
Computer Graphics is Dead!



Computer Graphics is Still Needed!



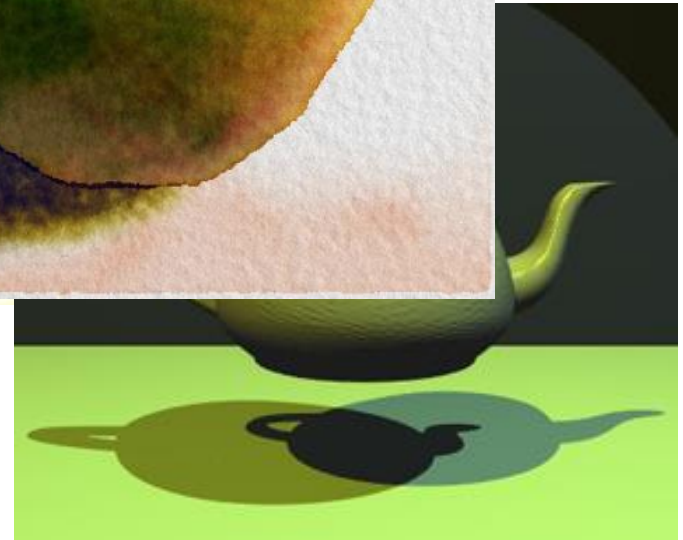
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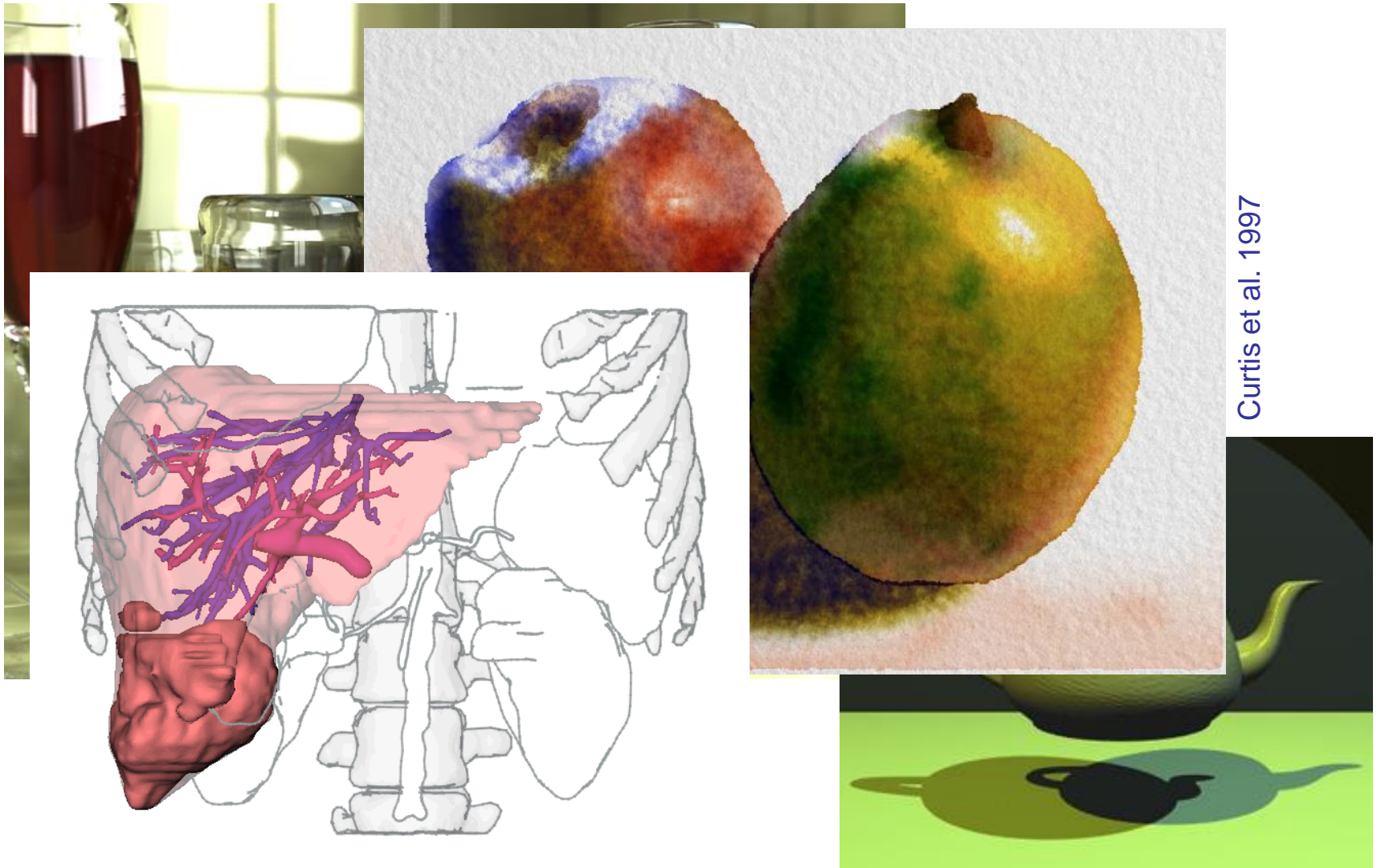
Computer Graphics is Still Needed!



Curtis et al. 1997



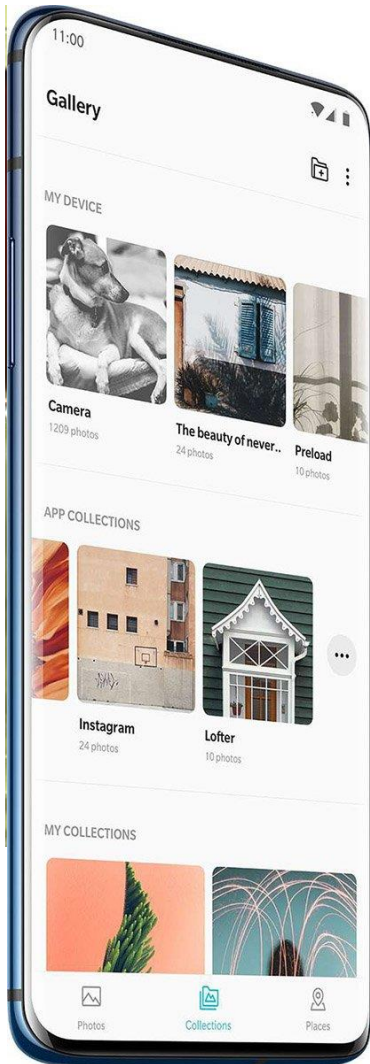
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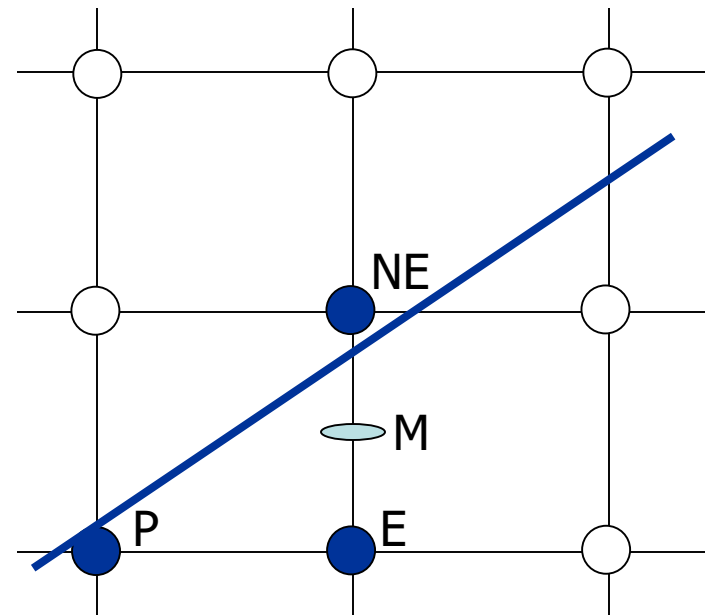


Computer Graphics is Still Needed!



Computer Graphics – Overview

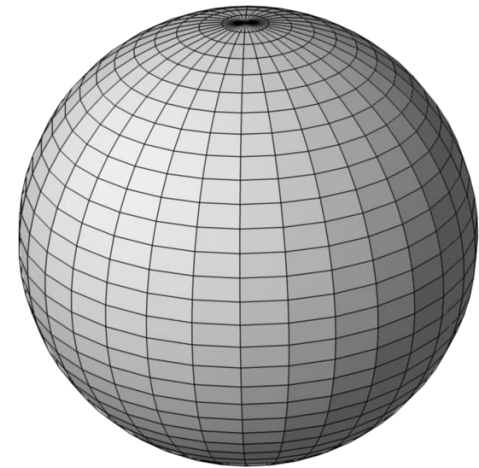
1. introduction,
scan conversion



Computer Graphics – Overview

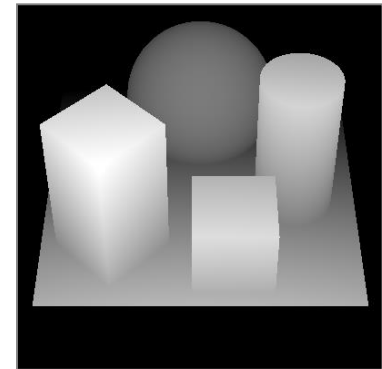
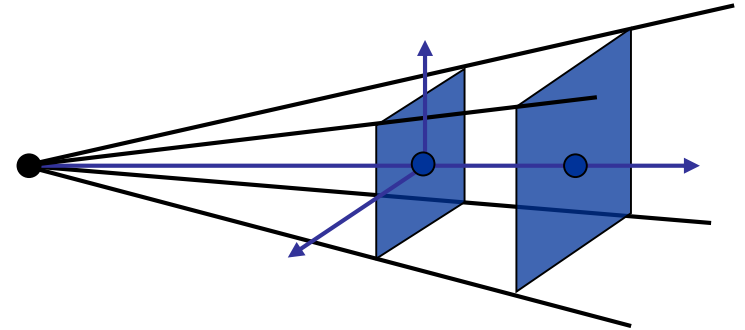
1. introduction,
scan conversion
2. 2D/3D transformations,
3D object representations

$$\begin{bmatrix} x' \\ y' \\ w' \end{bmatrix} = \begin{bmatrix} a & c & b \\ d & e & f \\ g & h & i \end{bmatrix} \begin{bmatrix} x \\ y \\ w \end{bmatrix}$$



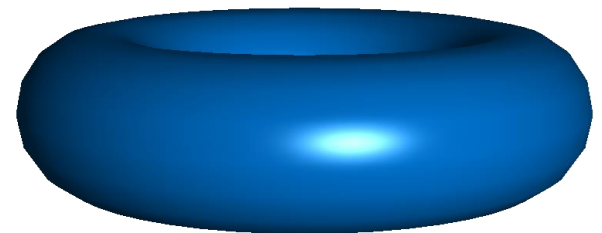
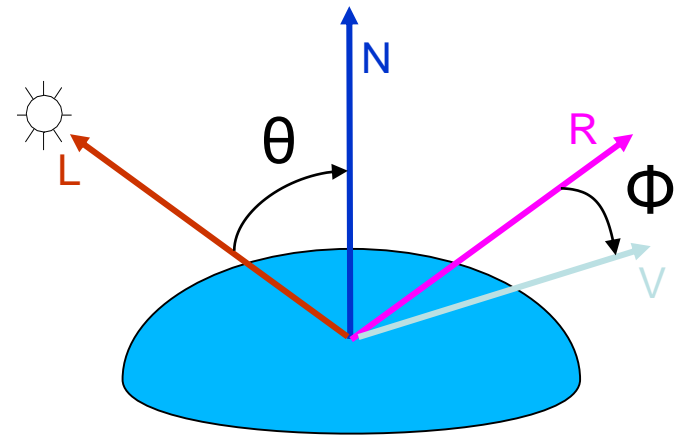
Computer Graphics – Overview

1. introduction,
scan conversion
2. 2D/3D transformations,
3D object representations
3. viewing/projections;
hidden surface removal



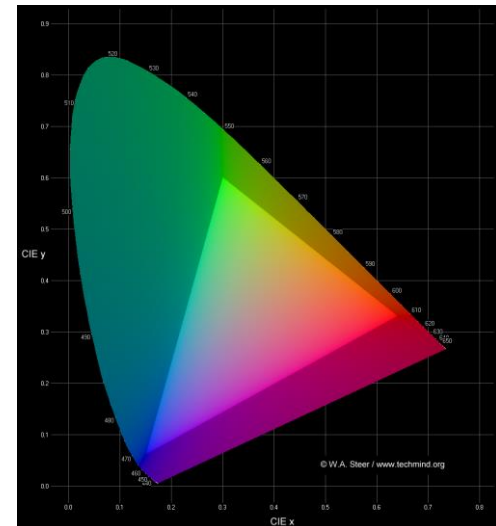
Computer Graphics – Overview

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4. illumination; shading



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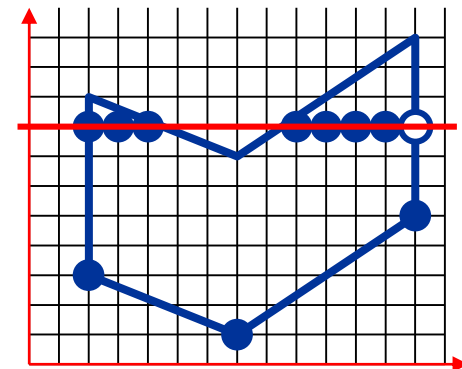
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5. texture mapping;
color and color models



Computer Graphics – Overview

1. introduction,
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3. viewing/projections;
hidden surface removal
4. illumination; shading
5. texture mapping;
color and color models
6. clipping; filling

1001	0001	0101
1000	0000	0100
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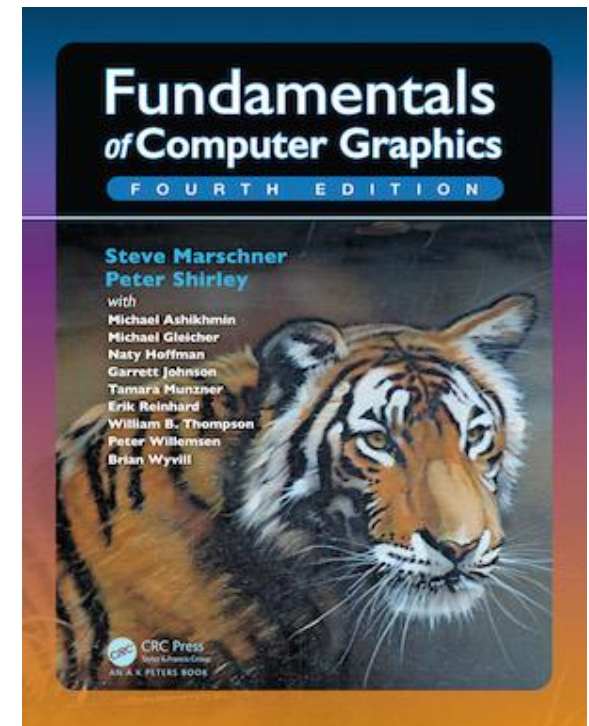


Rough plan

- 6 lectures in total:
 - intro, scan conversion
 - 2D/3D transformations
 - object representations, viewing
 - projections, HSR
 - illumination, shading
 - texture mapping
 - color, color models
 - clipping, filling

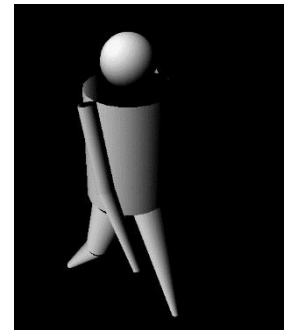
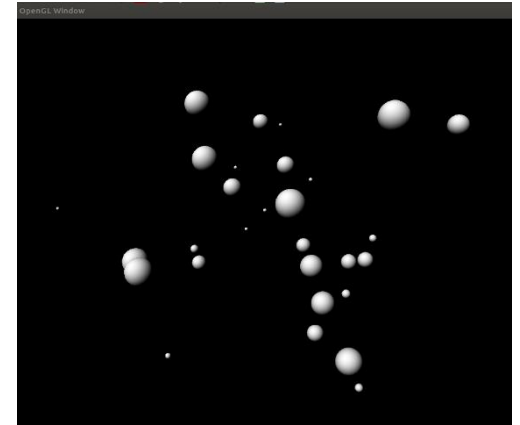
Computer Graphics – Lectures

- language: English
- materials and information:
<http://tobias.isenberg.cc/graphics-intro/>
- textbook: Peter Shirley et al.: Fundamentals of Computer Graphics, 4th ed., 2015, A K Peters, Ltd.
ISBN: 978-1-48222-939-4
- suggested readings for covered topics (2nd – 4th ed.)



Computer Graphics – TD/TP, Project

- taught by Paritosh Sharma
paritosh.sharma@universite-paris-saclay.fr
- taught in English/French
- OpenGL-based graphics programming
- TD1: intro/reminder OOP
- TD2–TD5: small assignments
- TD6: personal project (more time)

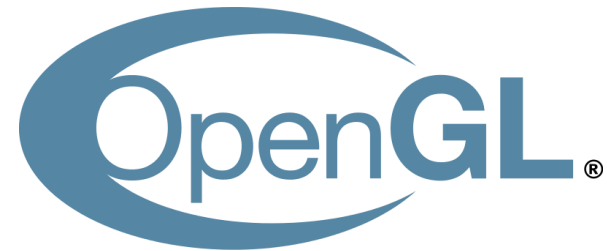


Computer Graphics – TD/TP, Project

- implementations in



- use of 3D graphics API

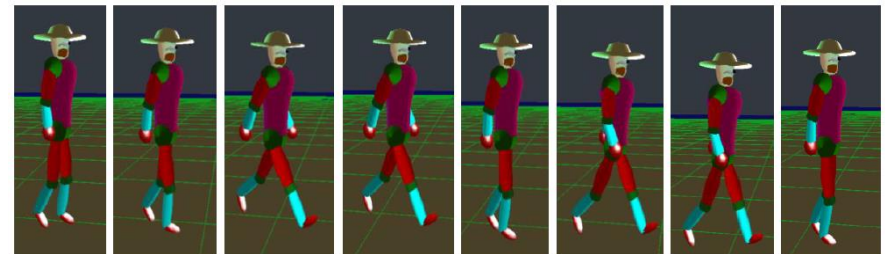
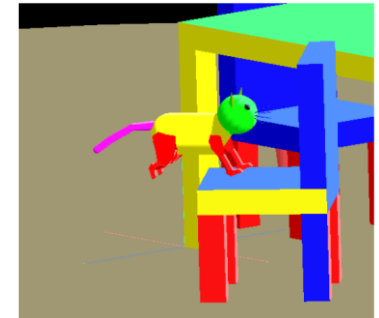
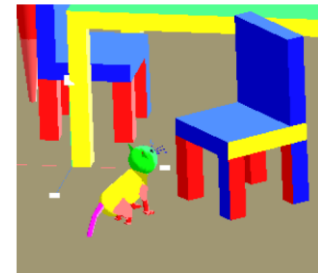
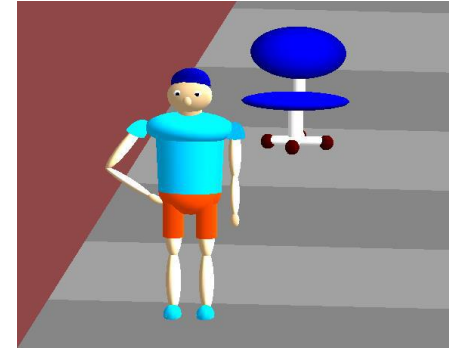


- other exist as well

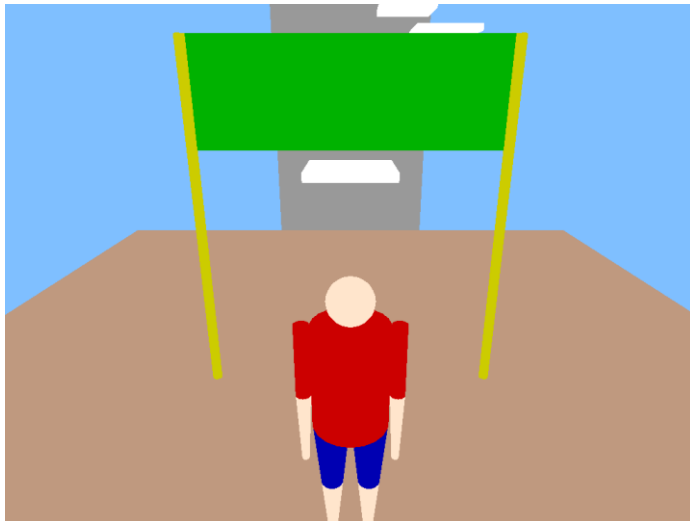
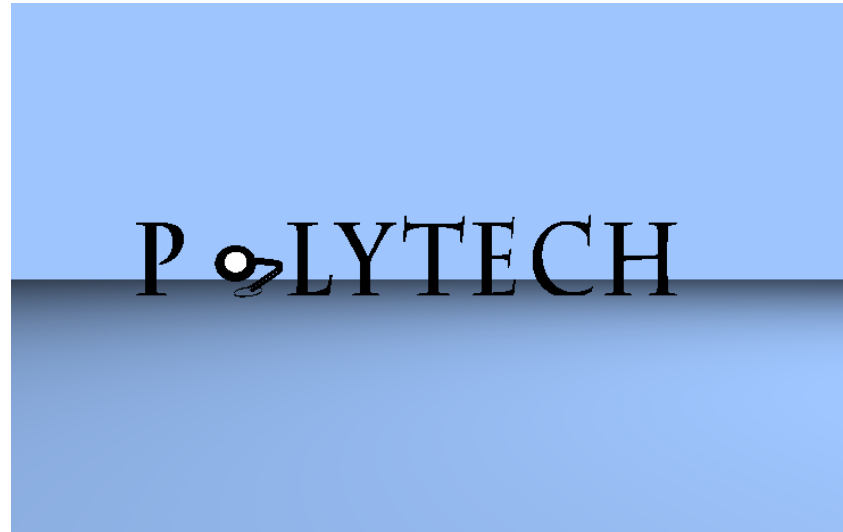
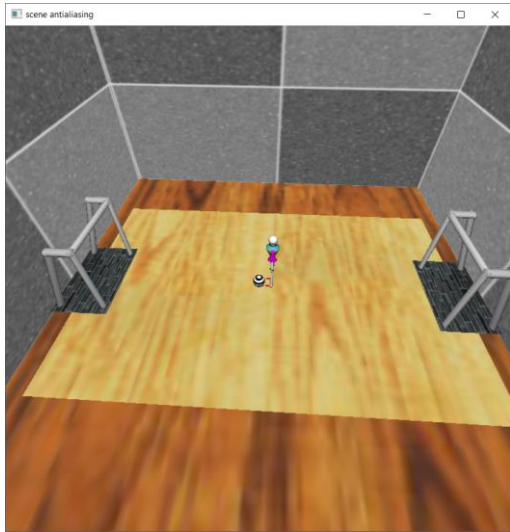


Computer Graphics – TD/TP, Project

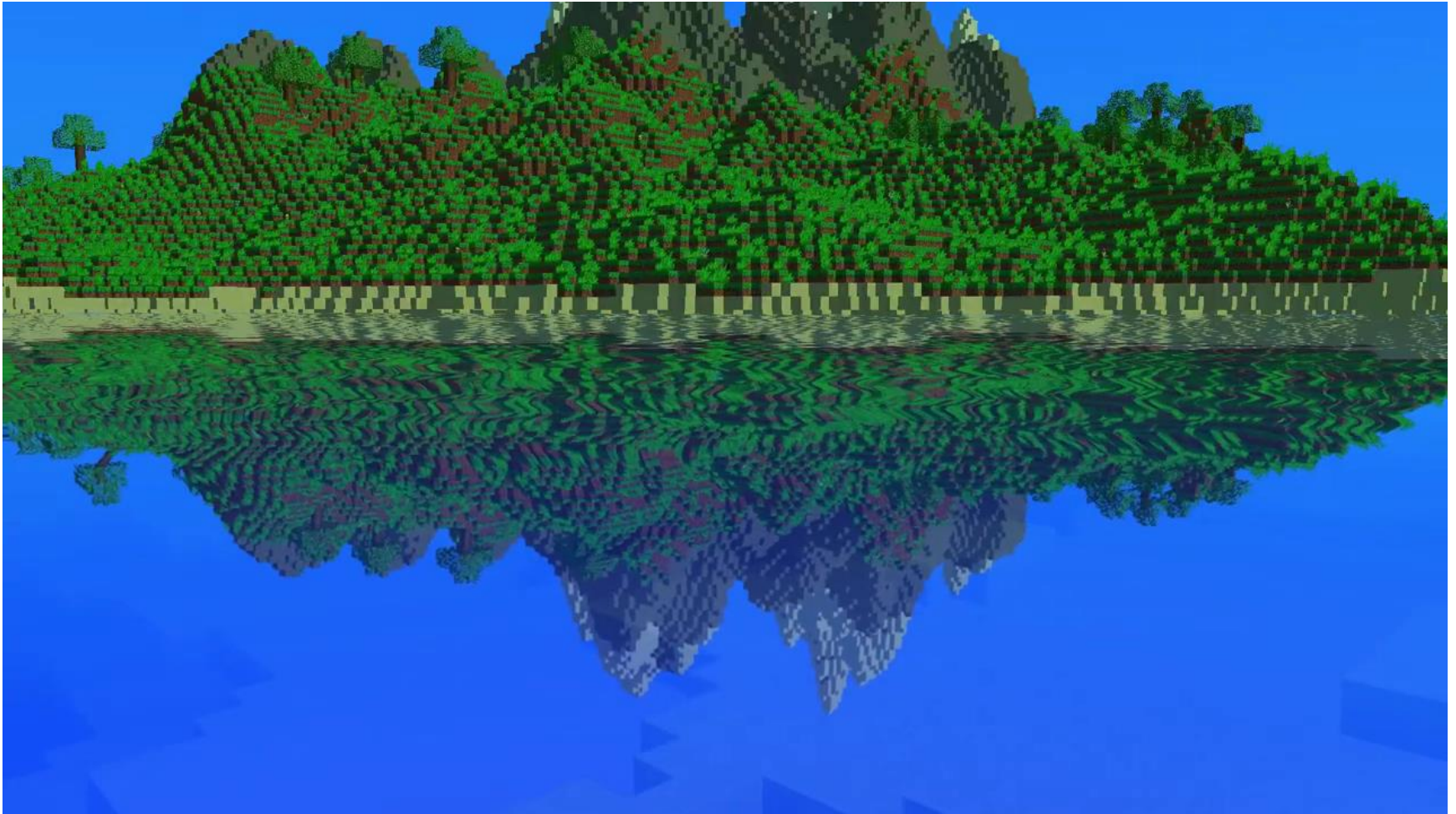
- personal project
 - technological advancement
 - quality programming
 - originality and creativity
 - project adapted to your skills
- examples from previous years



Computer Graphics – TD/TP, Project



Minecraft clone 2020/21 (1)



by Angel Uriot, Gaétan Renard, and Arthur Azambre (best student project of 2020/21)

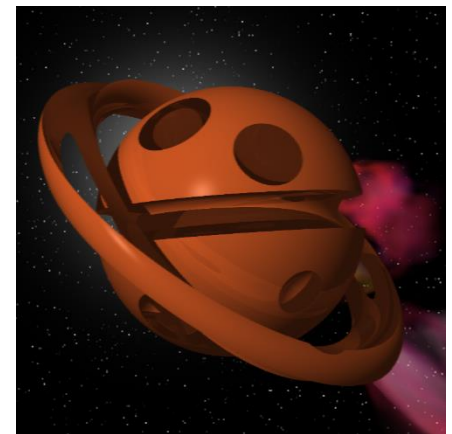
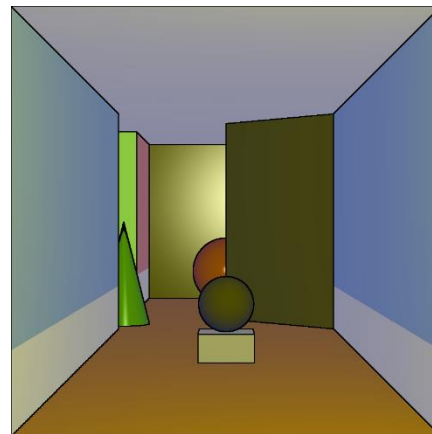
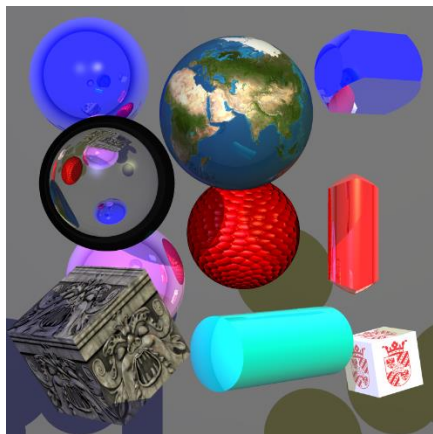
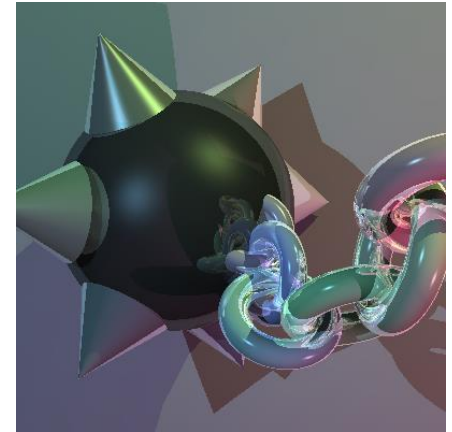
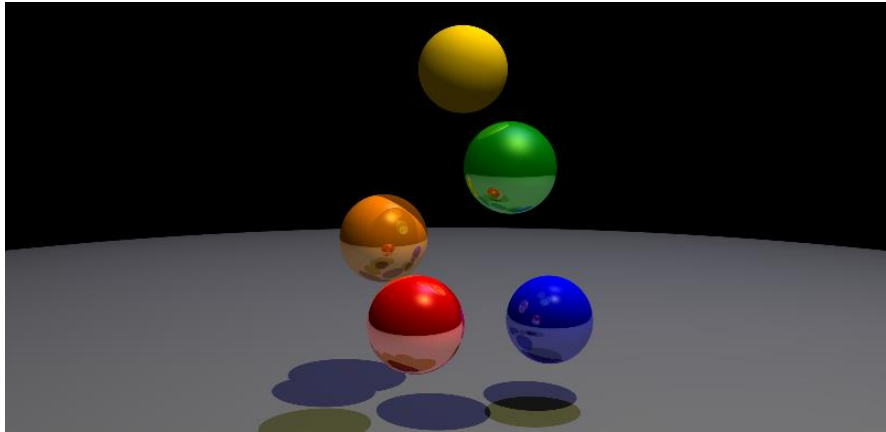
Minecraft clone 2020/21 (2)



by Mathis Brossier, Housseem Mahmoud, and Pierre Surer (best student project of 2020/21)

Advanced Graphics Class in ET5

- implementation of a raytracer




Grand CG Rendering Competition



CG: Grading and Rules

- final exam:
 - in English
 - multiple choice
 - everybody gets personal exam sheet
- cheating:
disciplinary actions
- sick during tutorial
or exam: call/e-mail
me beforehand



+1/1/60+

Introduction to Human-Computer Interaction Exam on 23/03/2016

- Time period: 8:00 – 11:00
- Duration of the exam: 180 min
- Number of pages: 8
- Materials allowed: Pencils, erasers

Please write your answers directly on the exam paper. ← Encode your student number here, and write the student number again as well as your given name and family name below. If you cannot remember your student number, use the number X you see at the top of the exam sheet in this code +X/Y/Z+.

<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0
<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
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<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
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Student number:
.....

Given name:
.....

Family name:
.....

- The questions with the symbol ♣ can have none, one, or more than one possible correct answers. All other questions have exactly one correct answer.
- Please answer the questions like this: ; use a **pencil** (hardness HB), and make clear marks. To correct, clearly erase the wrong mark and put a new one (if needed). If you cannot erase because you did not bring a pencil, make the incorrect box completely black.
- All multiple-choice questions are worth one point. For it to be counted as answered correctly, all correct answers and no incorrect answer have to be selected.
- Do not fold the answer sheet(s), do not write on the back.

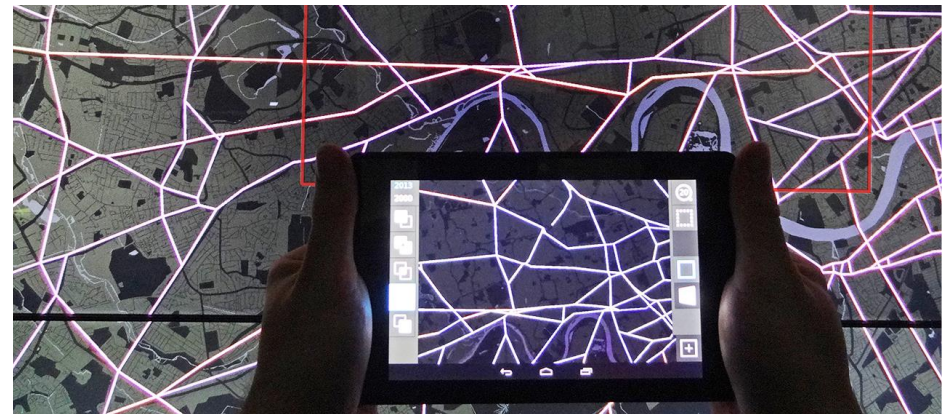
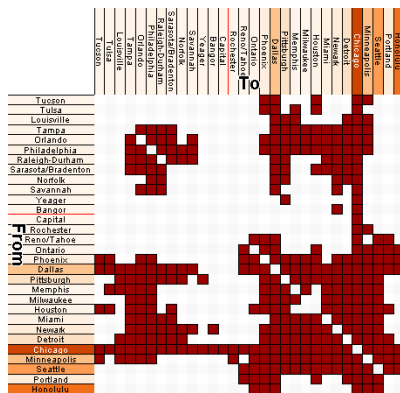
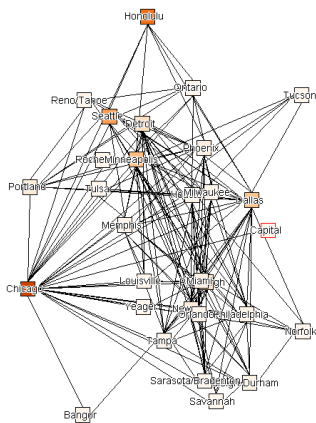
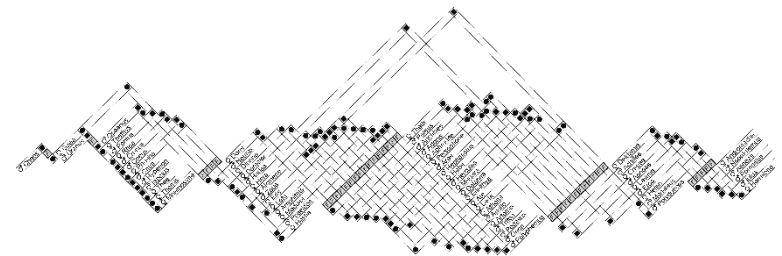
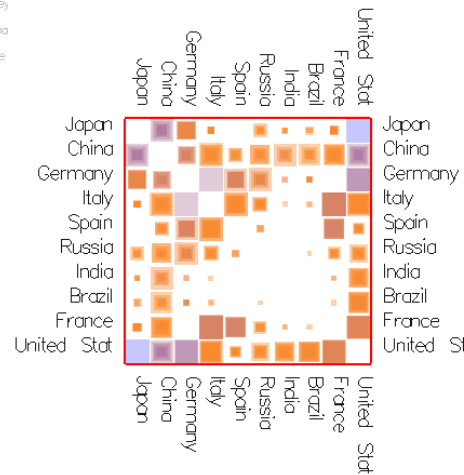
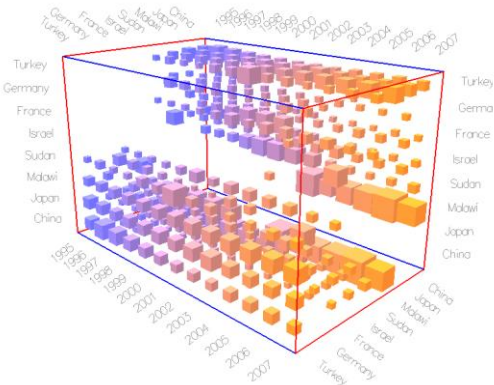
Question 1 Student did **NOT** bring a pencil. Do **NOT** fill out yourself.

Student brought a pencil.
 Student did not bring a pencil.

Multiple-Choice Questions:

Question 2 Driving to the supermarket but ending up at work is an example of which type of error

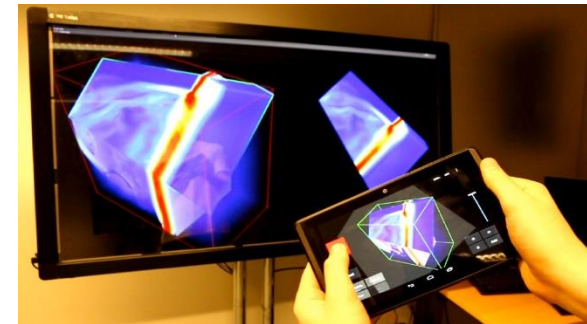
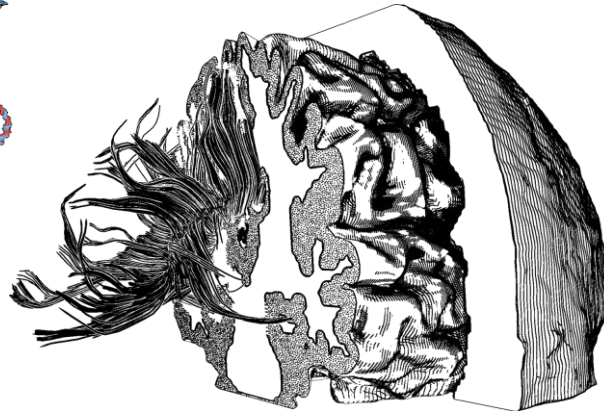
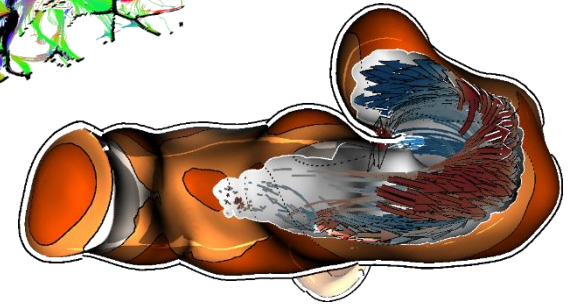
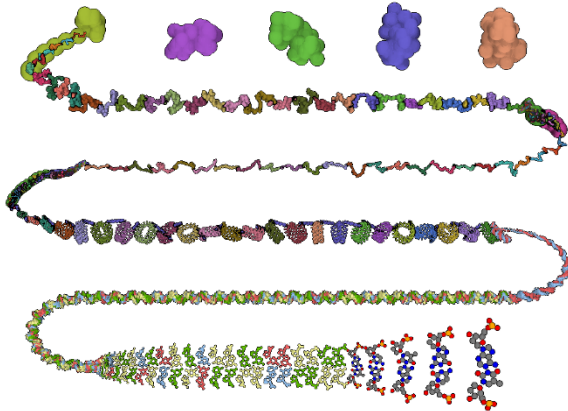
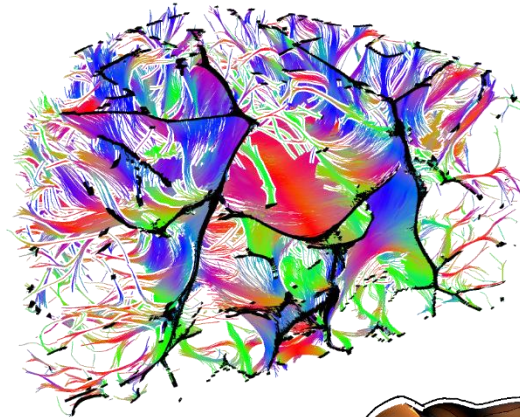
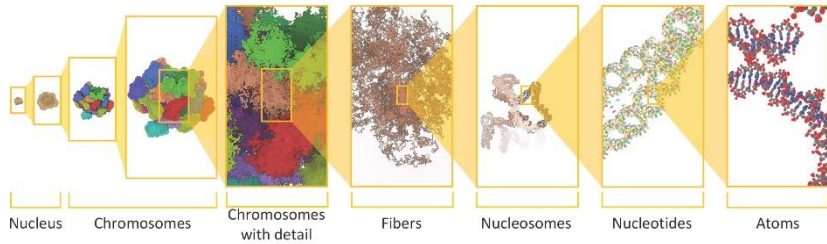
<input type="checkbox"/> description error	<input type="checkbox"/> none of the above
<input type="checkbox"/> a mistake	<input type="checkbox"/> mode error
<input type="checkbox"/> capture error	



Internships @ *inria* informatics mathematics



<http://www.aviz.fr/>



Computer Graphics

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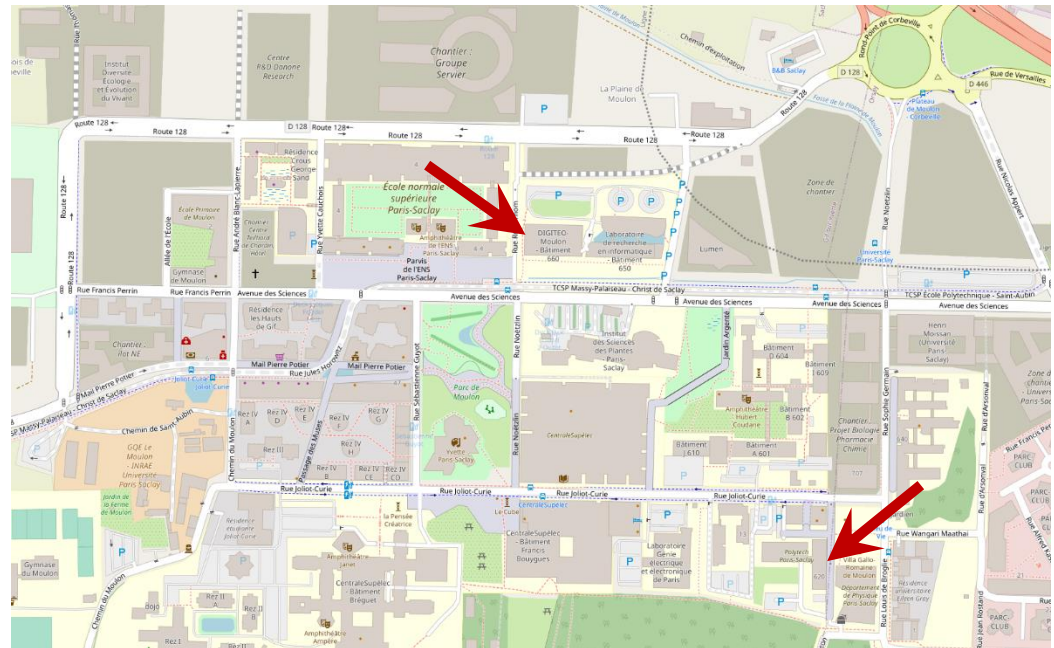
Introduction

Internships ...

- 2 internships
 - in ET4 (abroad?)
 - in ET5: final project, Master's thesis
- possible in research context, but not both possible in academic lab
- preparation for PhD work
- for both internships: ideal if you have something to show for
 - e.g., excellent project in CG

How to contact me

- e-mail: tobias.isenberg@inria.fr
- Web: <https://tobias.isenberg.cc/>
- office:
Digiteo-Moulon
(building 660),
room 1044
01-69156433



Further Rule



exceptions only for those who need the laptop for note taking

Computer Graphics

- Questions?
- if I speak too fast or you do not understand something, please ask (also in French)