Computer Graphics 1

Tutorial Organization

Summer Semester 2021
Ludwig-Maximilians-Universität München
Tutorials Team

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Wednesday 2 pm - 4 pm

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Thursday 4 pm - 6 pm

CS
Purpose

- Practice and consolidation of lecture content
- Hands-on activities and discussion
- Addressing issues in doing the assignments
- Opportunity to discuss and ask questions with your fellow classmates
- Preparation for future work/research fundamental skills
Syllabus (Tentative)

- **Register** yourself via Uni2Work and Moodle!
- **Timetable:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.04/22.04</td>
<td>01 Getting Started With Graphics Programming</td>
<td>JavaScript basics, Git, Markdown, graphics programming with three.js</td>
</tr>
<tr>
<td>28.04/29.04</td>
<td>02 Transformation</td>
<td>Linear algebra, affine transformations, 3D rotations</td>
</tr>
<tr>
<td>05.05/06.05</td>
<td>03 Geometry Representations</td>
<td>Geometric representation, Bezier, CSG, mesh sampling, LOD</td>
</tr>
<tr>
<td>12.05/13.05</td>
<td>04 Camera Viewing Pipeline</td>
<td>Model-view transformation, orthographic and perspective projections, viewport</td>
</tr>
<tr>
<td>19.05/20.05</td>
<td>05 Rasterization Pipeline I</td>
<td>Bounding box, bounding volume hierarchy, culling, drawing</td>
</tr>
<tr>
<td>02.06/03.06</td>
<td>06 Rasterization Pipeline II</td>
<td>Anti-aliasing, rendering pipeline, shading language</td>
</tr>
<tr>
<td>09.06/10.06</td>
<td>07 Texture</td>
<td>Texture mapping, barycentric interpolation, MIP map</td>
</tr>
<tr>
<td>16.06/17.06</td>
<td>08 Shading and Shadowing</td>
<td>Blinn-Phong Surface Shading, Shading frequency, Shadow maps</td>
</tr>
</tbody>
</table>
Live Session

Tutorial Session 1

- Location: Zoom
- Time: Wednesday 2pm - 4pm

Tutorial Session 2

- Location: Zoom
- Time: Thursday 4pm - 6pm
**Graded Assignments Policy**

- Graded assignments are considered as examination of your study, and there are 6 graded assignments
- 100 points in total, 50 points to pass with 4.0, and 90 points or more to get 1.0
- Assignments are turned in via Uni2Work, you can write either in German or English or mix
- Registering to the exam is necessary for doing the graded assignments
- We do **not** accept group submissions
- We do **not** accept late submissions
- Timetable:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Submission Period (Anywhere on Earth, AoE)</th>
<th>Points</th>
<th>Major Topic</th>
<th>Solution Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30.04 - 04.05 (05 days)</td>
<td>10</td>
<td>Transformation</td>
<td>on Tutorial 3</td>
</tr>
<tr>
<td>2</td>
<td>07.05 - 14.05 (08 days)</td>
<td>20</td>
<td>Geometry</td>
<td>on Tutorial 5</td>
</tr>
<tr>
<td>3</td>
<td>17.05 - 26.05 (10 days)</td>
<td>20</td>
<td>Camera</td>
<td>on Tutorial 6</td>
</tr>
<tr>
<td>4</td>
<td>28.05 - 06.06 (10 days)</td>
<td>20</td>
<td>Rasterization</td>
<td>on Tutorial 7</td>
</tr>
<tr>
<td>5</td>
<td>14.06 - 25.06 (12 days)</td>
<td>20</td>
<td>Material</td>
<td>No Discussion</td>
</tr>
<tr>
<td>6</td>
<td>28.06 - 04.07 (7 days)</td>
<td>10</td>
<td>Illumination</td>
<td>No Discussion</td>
</tr>
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</table>
Cheating Policy

- Suggestion: You don't
- In case of suspicious behavior/submission, you will be asked to explain your submission in an oral exam
- In the worst case, you will be withdrawn from the entire course, and one can only rejoin next year
FAQ

Q: Do I need to submit the calculation/problem-solving process in assignments?
A: Yes, your thought process is helpful for us to correct your submissions. *But dependent assignment tasks assume previous results to be correct, and thus you won’t get points for intermediate results.*

Q: Will the assignments solutions be discussed in the tutorial?
A: Yes.

Q: Do I have to master **JavaScript** [*TypeScript*] to success in CG1?
A: No, and Yes. "No" means you don’t have to know every detail about JavaScript/TypeScript, because the languages are designed for many different purpose. "Yes" means that we select JavaScript/TypeScript for graphics programming because of the following reason: 1) Familiarity: almost all students learned Java and JavaScript from prerequisites and TypeScript is compatible with JavaScript, offers static typing and easier for debugging; 2) Simplicity: Compare to C++; 3) Cross-platform: (almost) OS/Hardware irrelevant (everyone has a browser); 4) Infrastructure: existing open source facility, i.e. three.js. 5) … and of course more reasons 😊

Certainly, we need several basic building blocks such as function, class, for loop, etc., to be able to write programs. Remember: *Language is not an issue for graphics.*

Q: There are pieces of stuff not detailly discussed in the lecture but appears in the tutorial (and vise versa). Why are they relevant for me?
A: Everything is connected.

Q: Do I have to remember the three.js APIs by hard?
A: No. We do everything open book, so you can always fetch the API docs.

*If you have more questions, please post them in the Moodle’s discussion form.*