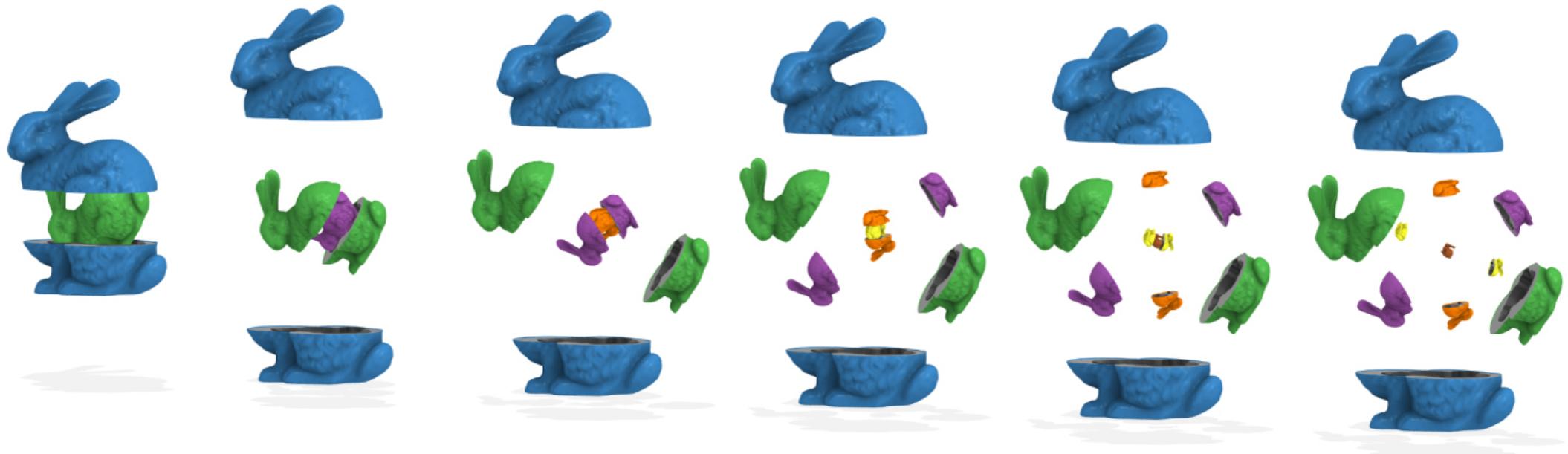


csc418 Computer Graphics



Computer Graphics

Course web site (includes course information sheet):

<https://github.com/psarahdactyl/computer-graphics-csc418>

Instructors:

Sarah Kushner csc418-2020-05@cs.toronto.edu

Office Hours: by appointment

Questions on Assignments: Github issues pages

Questions on Administrative stuff: Quercus

Schedule

Lectures:

Mondays, Wednesdays 1-2pm EDT on Zoom

Lectures will be recorded and uploaded a few days later

Slides will be posted on github

Tutorials:

Fridays 1-2pm EDT on Zoom

Schedule (on the webpage)

Week	Topic / Event
May 4	Introduction, Demos of Solutions Assignment 1 (Raster Images) due 12/05
May 11	Assignment 2 (Ray Casting) due 19/05
May 18	No class on Monday (Victoria Day), Wednesday: Introduce Ray Tracing
May 25	Assignment 3 (Ray Tracing) due 02/06
June 1	Assignment 4 (Bounding Volume Hierarchy) due 09/06 (Note: ./intersections related portion only worth 10%)
June 8	Assignment 5 (Meshes) due 16/06 (Note: ./quad_subdivision related portion only worth 10%)
June 15	Monday: Meshes assignment, No class Wednesday
June 22	No class
June 29	No class <i>Study for exam next week.</i>
July 6	Monday: exam review, In class exam Wednesday July 8 (15% of grade)
July 13	Assignment 6 (Shader Pipeline) due 21/07
July 20	(Drop date) Assignment 7 (Kinematics) due 28/07 (Note: inverse kinematics I, i related portion only worth 10%)
July 27	Assignment 8 (Mass-Spring Systems) due 4/08
August 3	The future of Computer Graphics
August 10	<i>Exam Review Study for exam next week.</i>
August 17	Final exam (20% of grade)

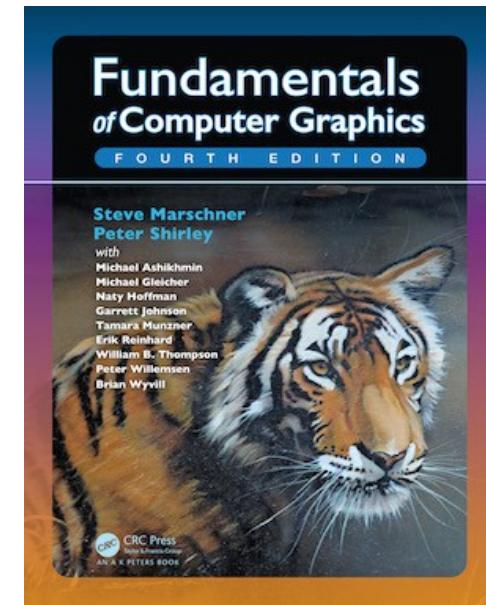
You will need:

a computer you can install software on/code the assignments on

an internet connection that allows you to stream video

availability during class and tutorial times

the textbook for required readings



Academic Honesty Policy

It's on the webpage and is mandatory reading!

Marking Scheme

Grading:

%	Item
1%	Pre-test & survey
8%	Assignment 1
8%	Assignment 2
8%	Assignment 3
8%	Assignment 4
8%	Assignment 5
8%	Assignment 6
8%	Assignment 7
8%	Assignment 8
15%	Midterm exam
20%	Final exam

Tutorial sessions:

- Work on assignments, TAs will be there to help you

Today

1. Introduction to Computer Graphics
2. Preview of class assignments
3. Raster Images

Prerequisites

Goals:

1. Show you what kind of mathematical background is expected in this course
2. Show you what you need to brush up on. Questions about these basic math operations will not be answered by either Professors or TAs, we expect you to know this stuff.
3. Give you a sense of how ready you are to take this course.

Time: 20 minutes (should be more than enough)

Introduction to Computer Graphics

What is Computer Graphics?

Computers:
accept, process, transform and present information.

Computer Graphics:
accept, process, transform and present information
in a visual form.

“Core” Areas of Computer Graphics

Modeling

Rendering

Animation



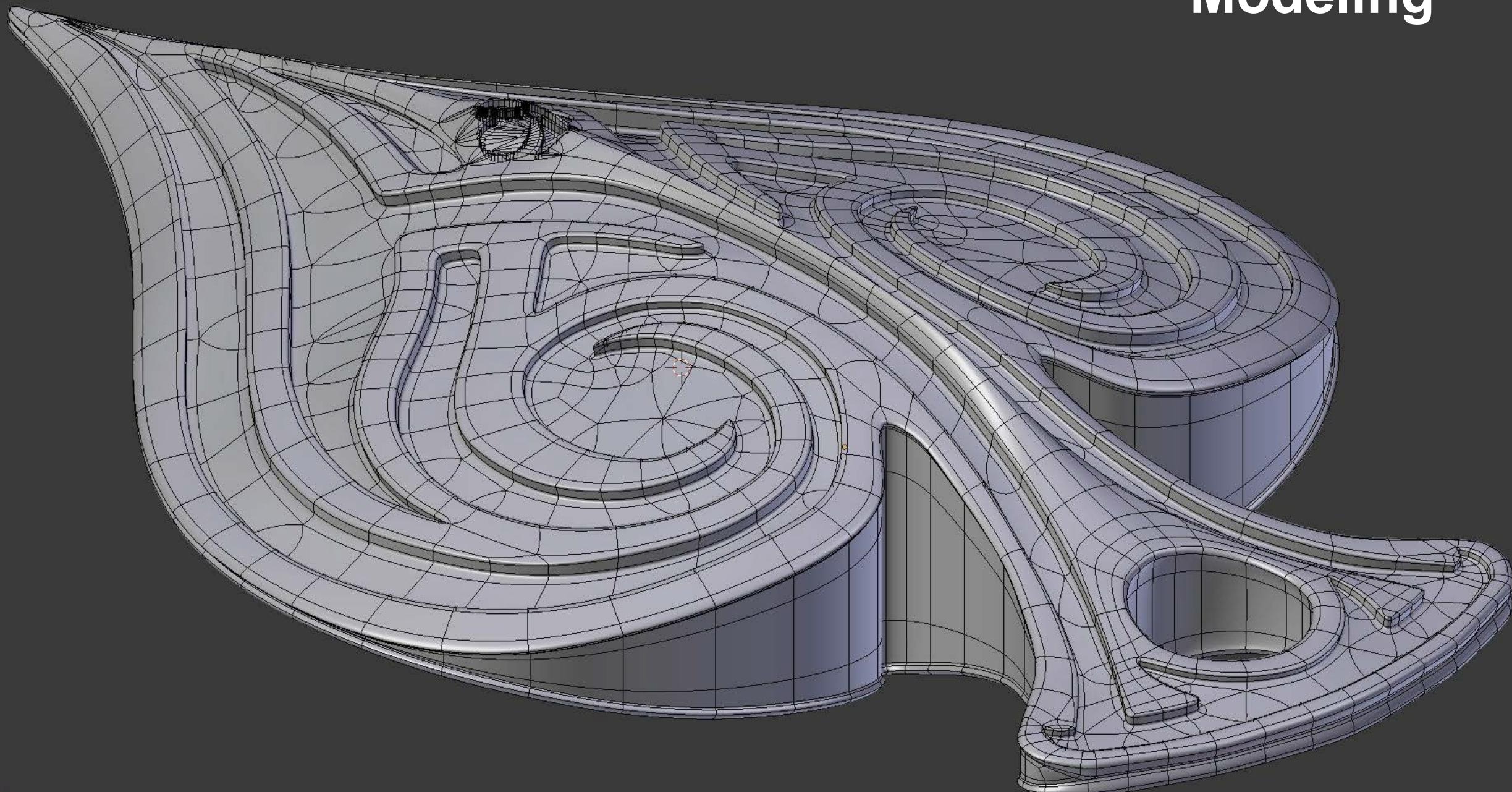
File Render Window Help Back to Previous

Cycles Render

v2.77 | Verts:0/7,223 | Edges:0/14,649 | Faces:0/7,424 | Tris:14,454 | Mem:92.44M | Curve:0.0

Modeling

User Ortho (Local)



<http://www.blenderunleashed.com/tutorials/essential-modeling-skills-basic-operators-part-2/>

Rendering



Animation



Other Areas of Computer Graphics

User Interaction

Virtual Reality

Visualization

Image Processing

3D Scanning

Computational Photography

Assignment Previews

Raster Images

Ray Casting

Ray Tracing

Boundary Volume Hierarchies

Meshes

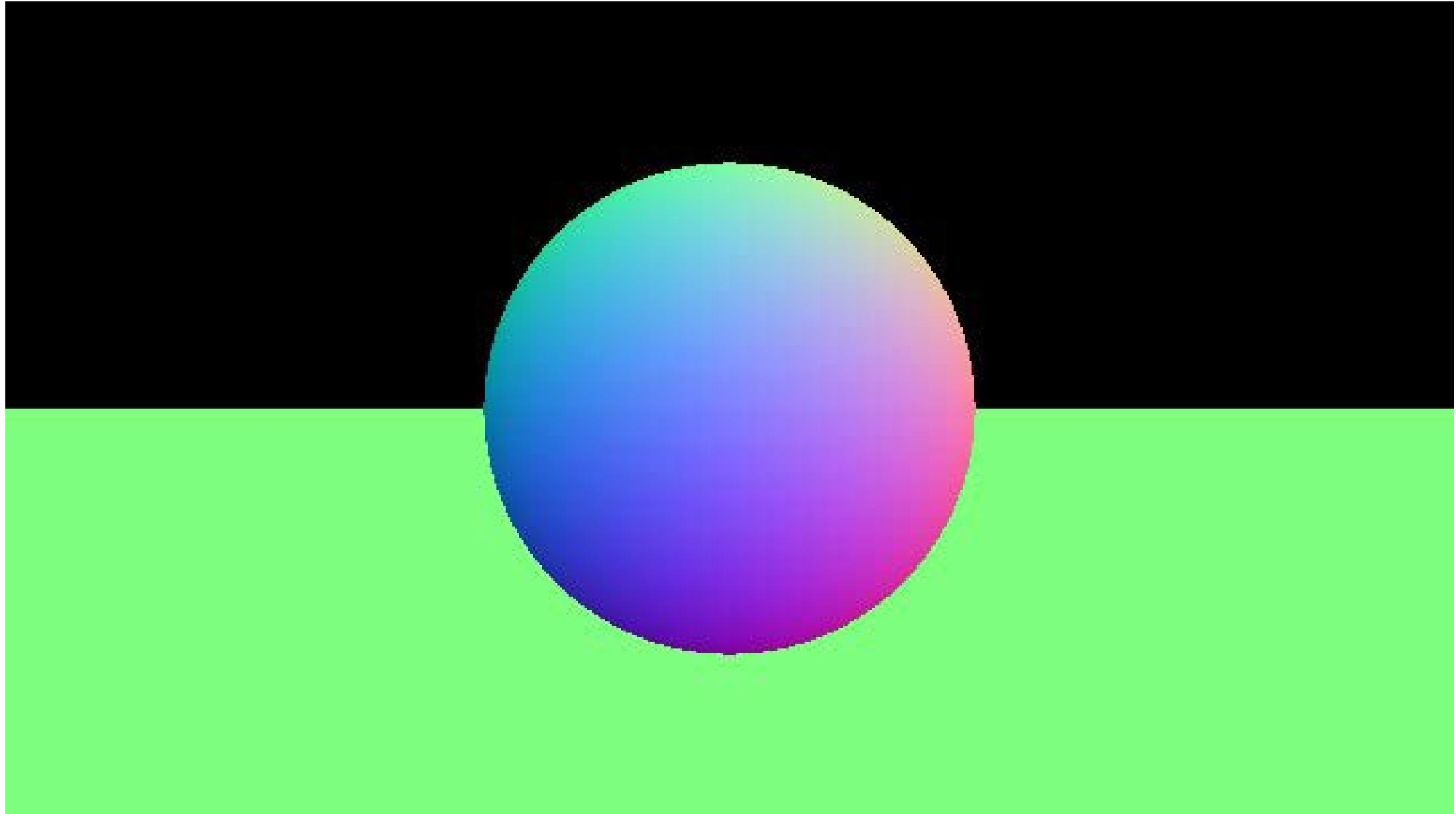
Shaders

Kinematics

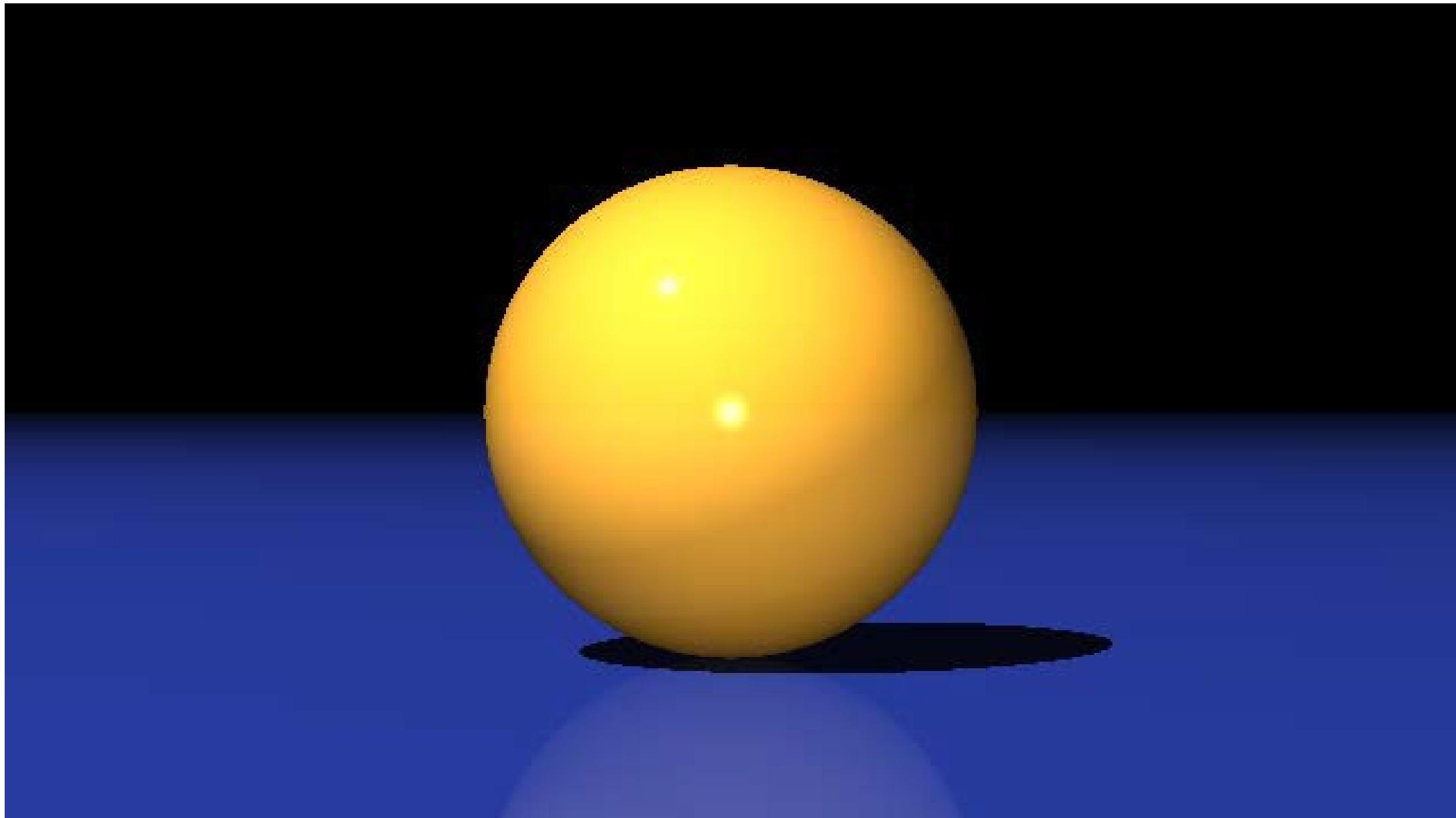
Mass-Springs

Final Project: Image Showcase! (extra credit)

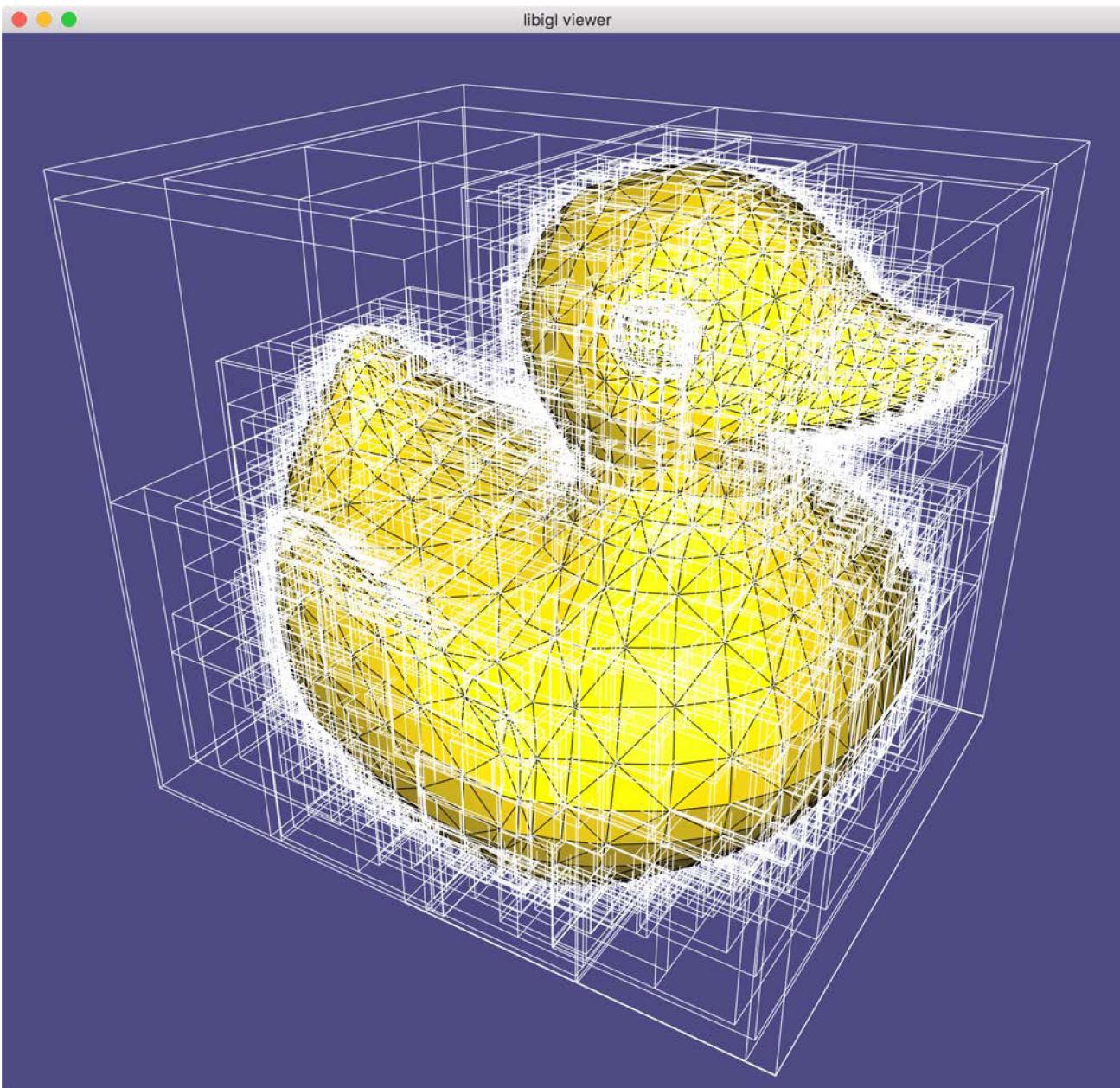
Ray Casting



Ray Tracing

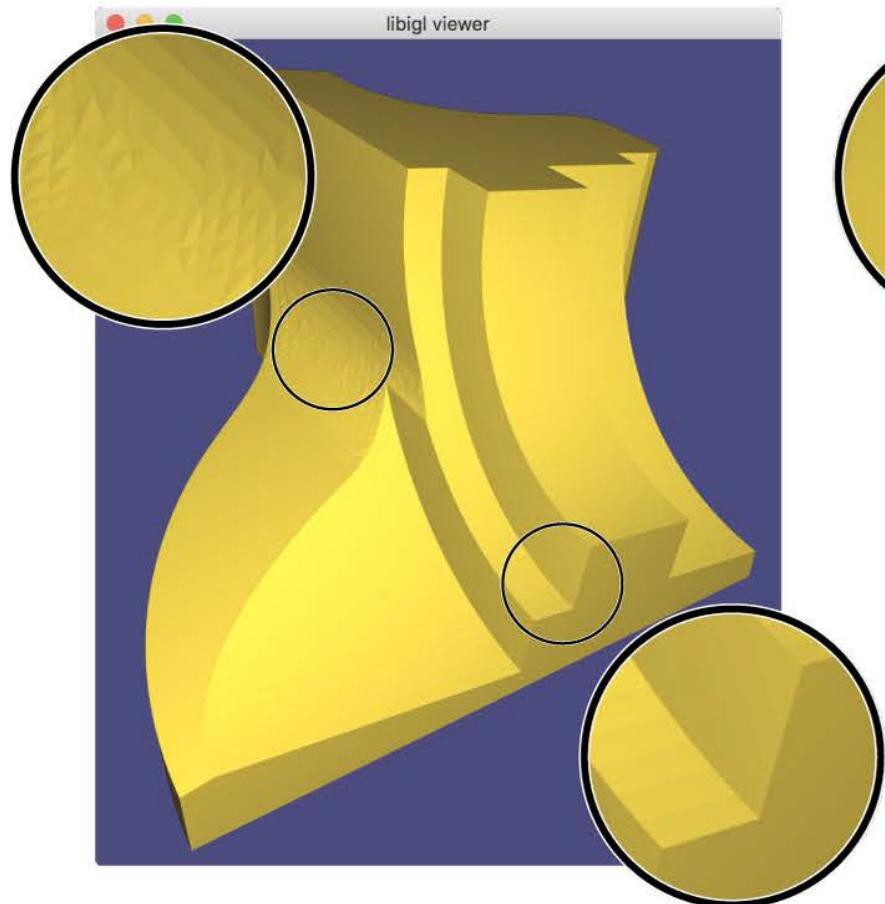


Boundary Volume Hierarchies

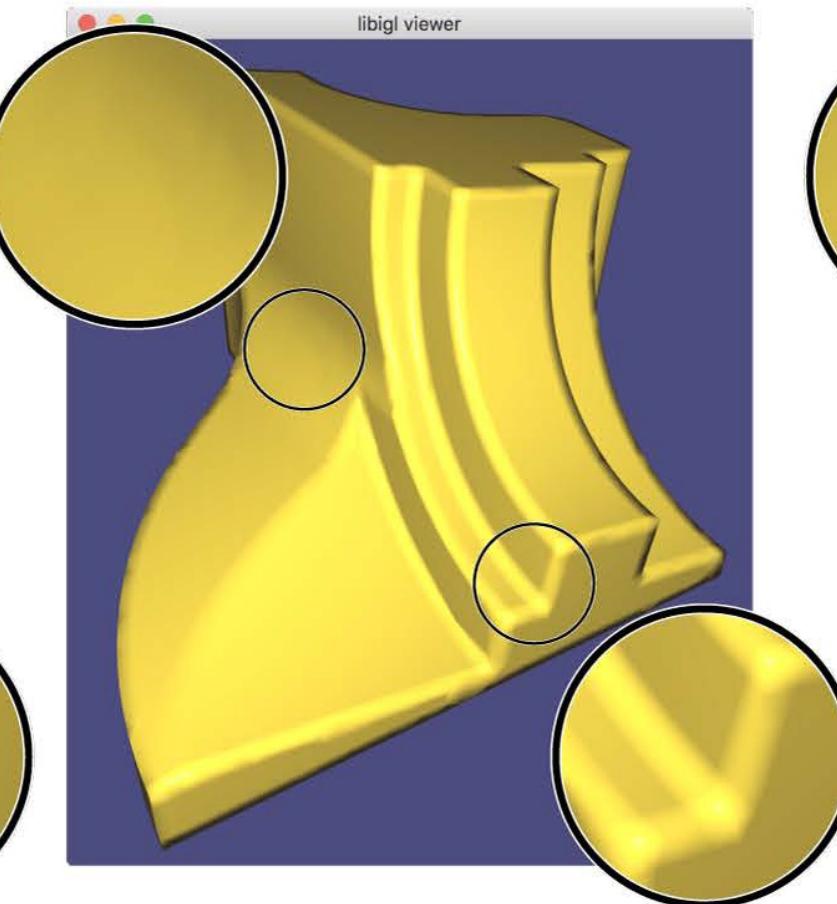


Meshes

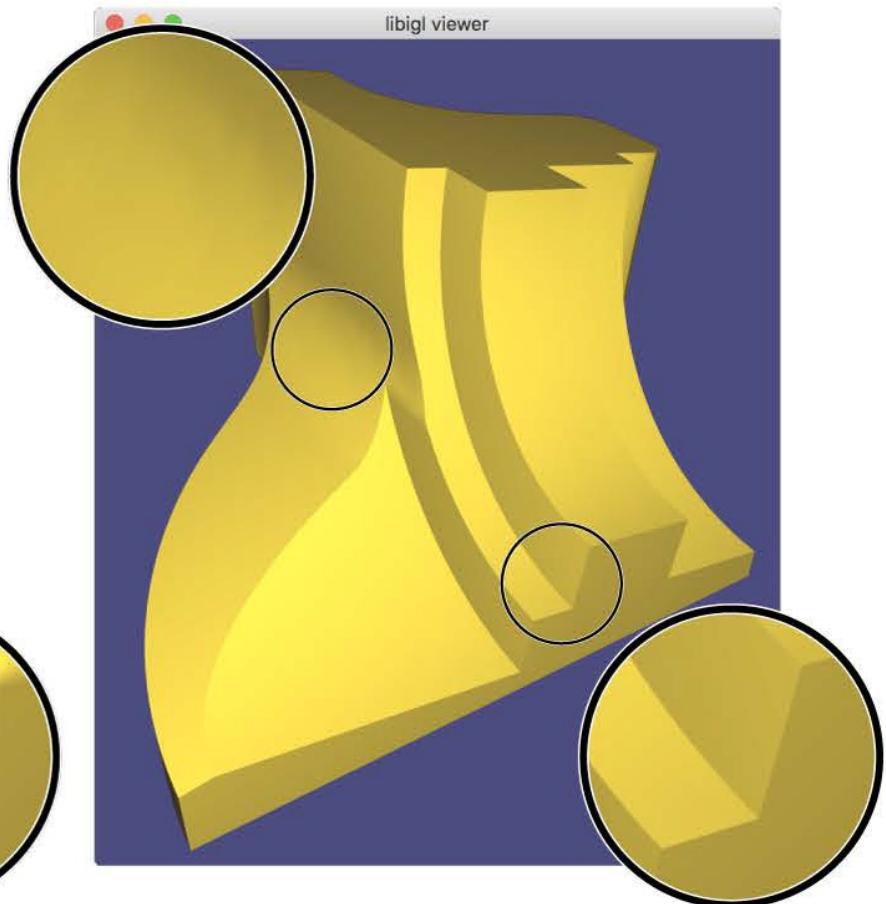
Per-face normals



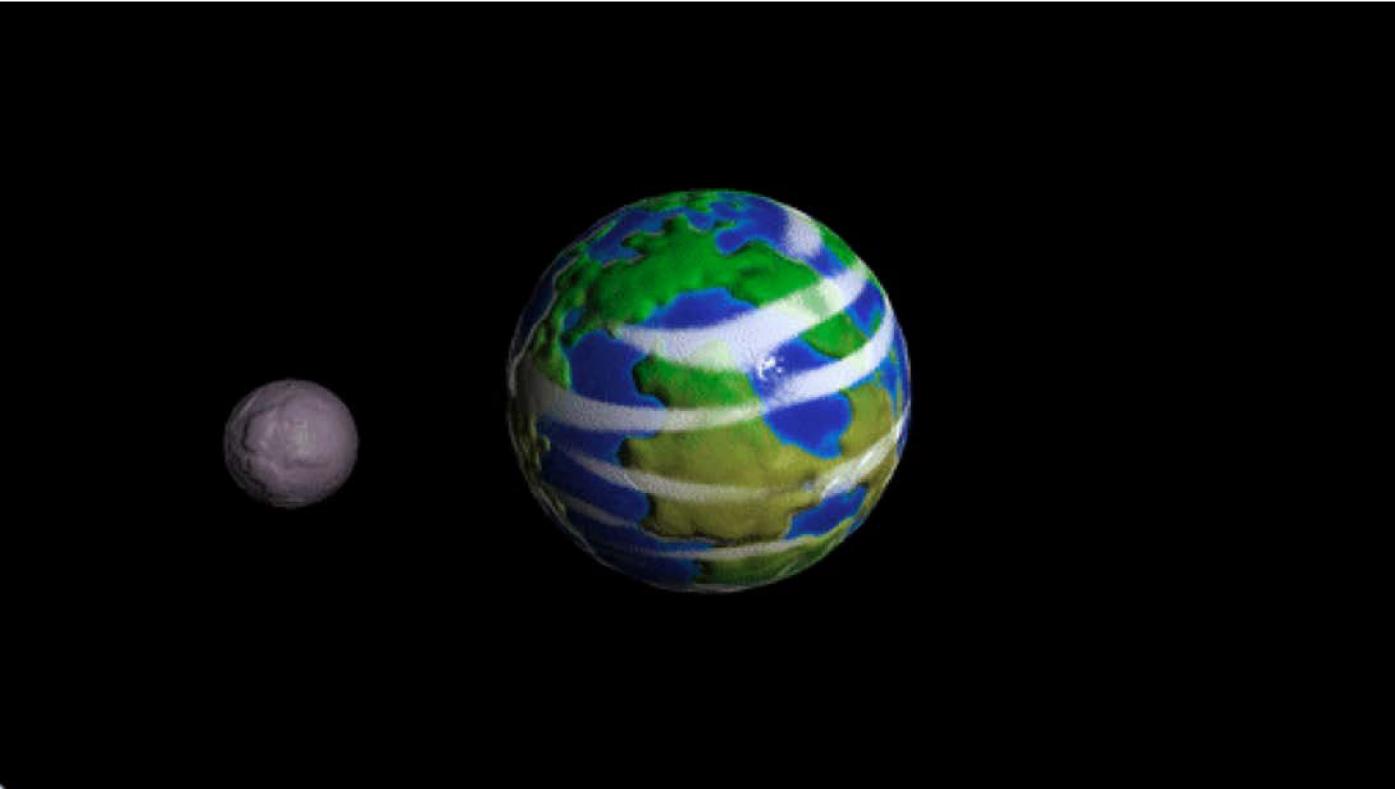
Per-vertex normals



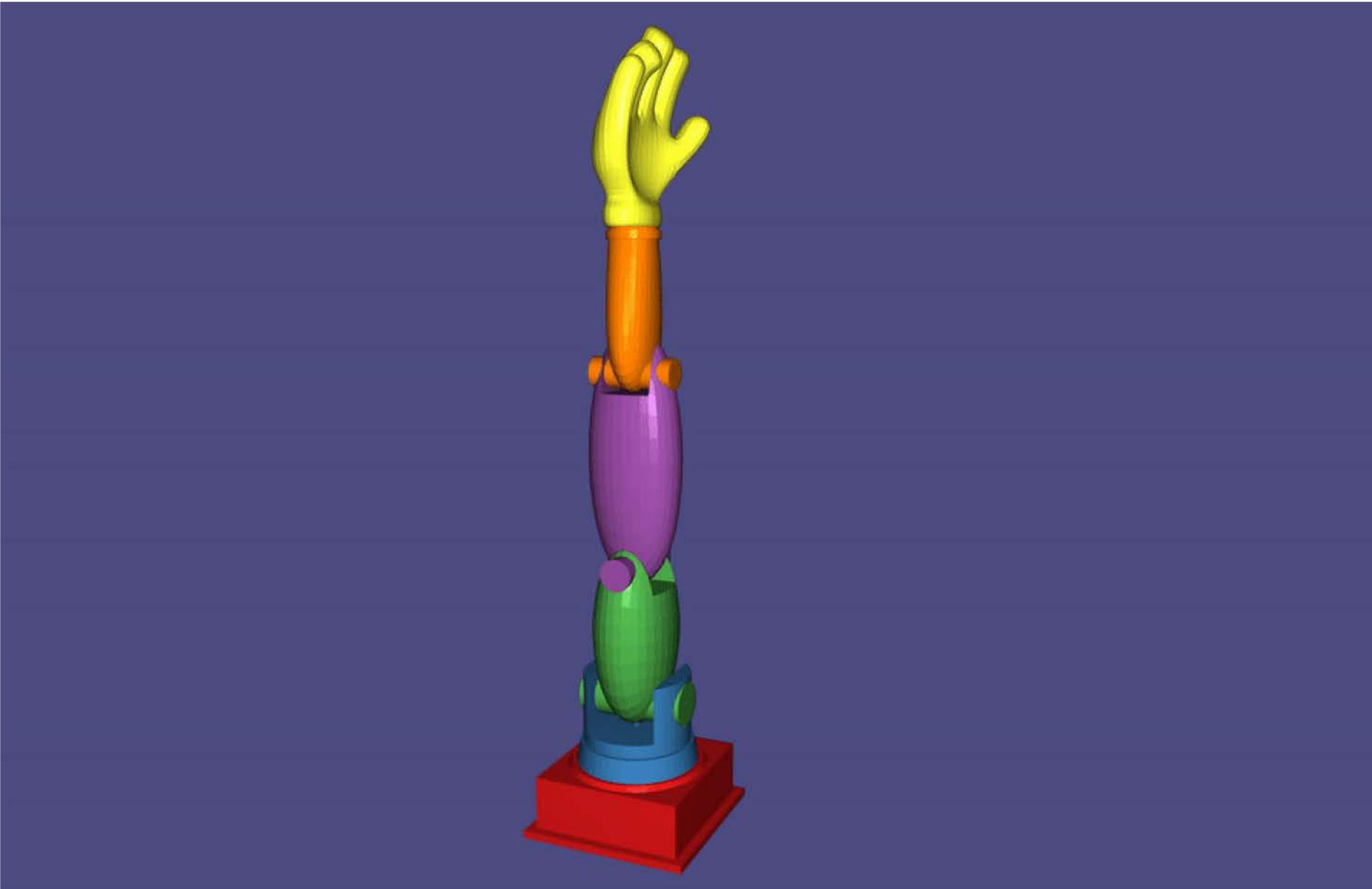
Per-corner normals



Shaders



Kinematics



Mass-Springs



Raster Images

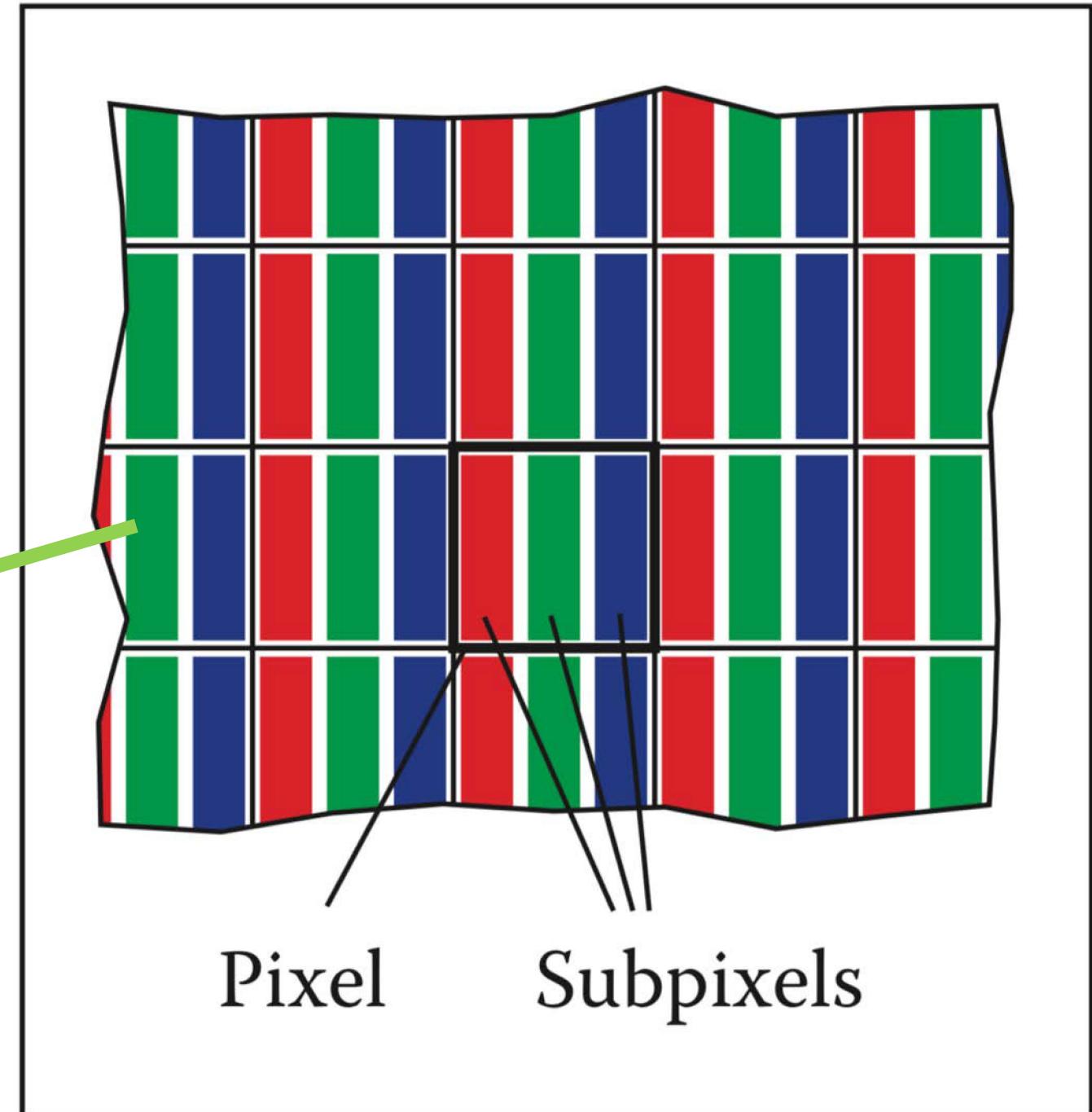
Raster Displays



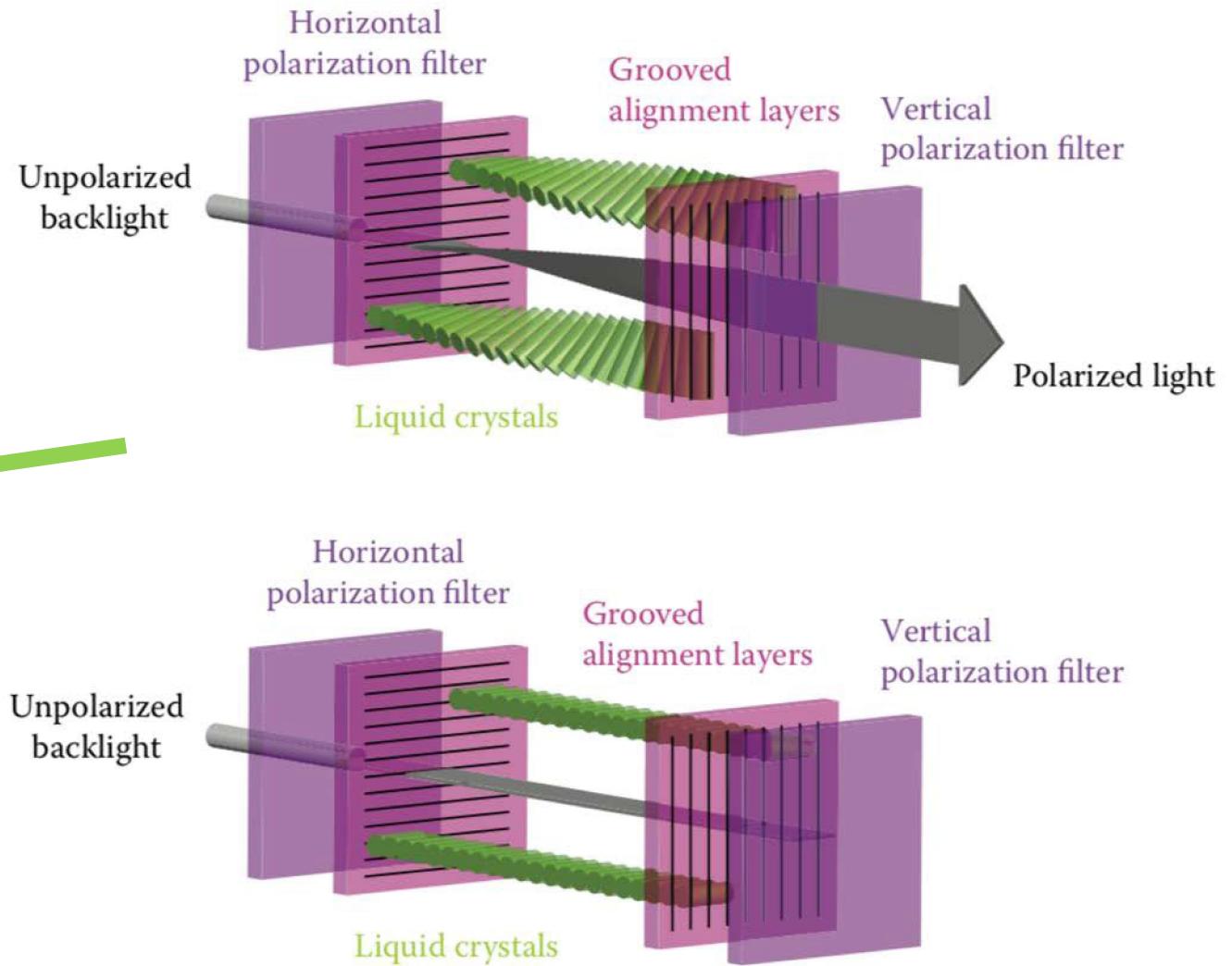
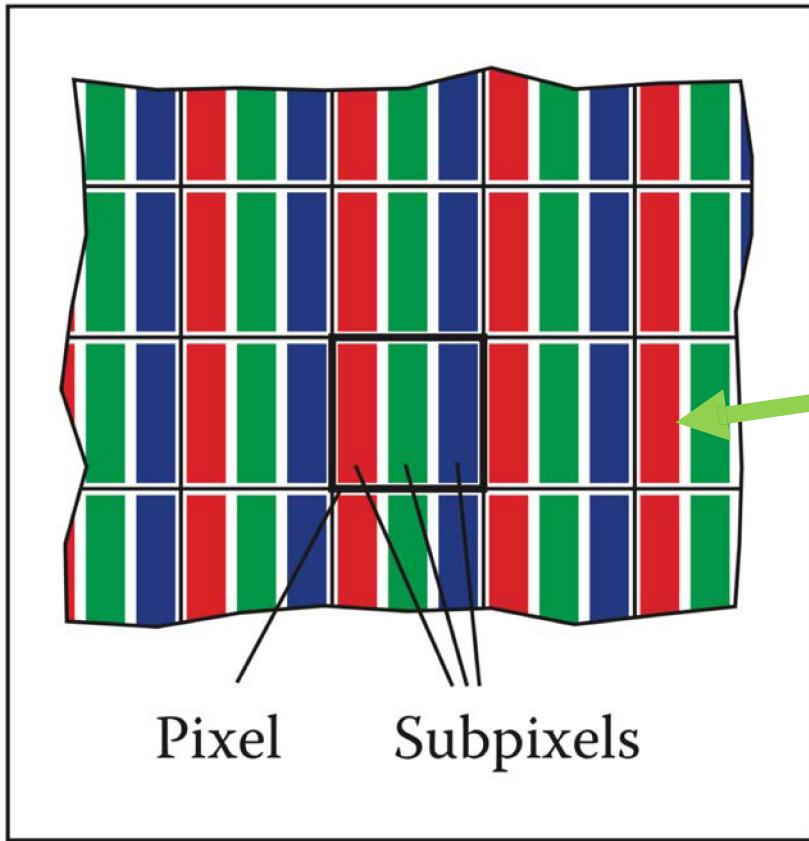
Raster Displays



Raster Displays



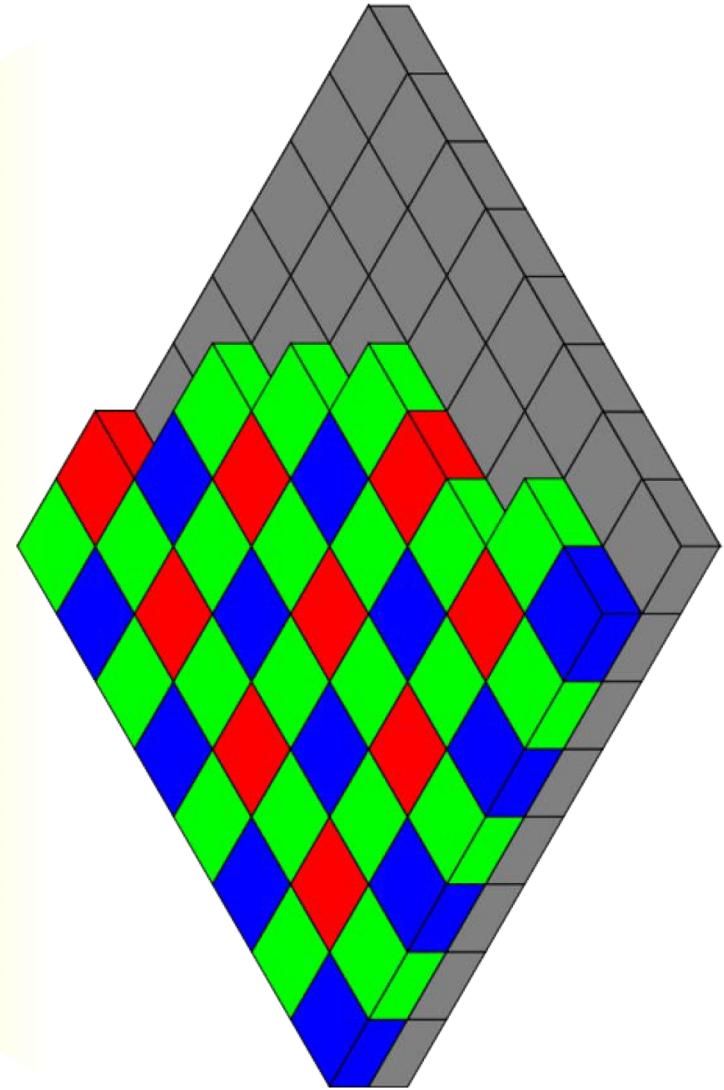
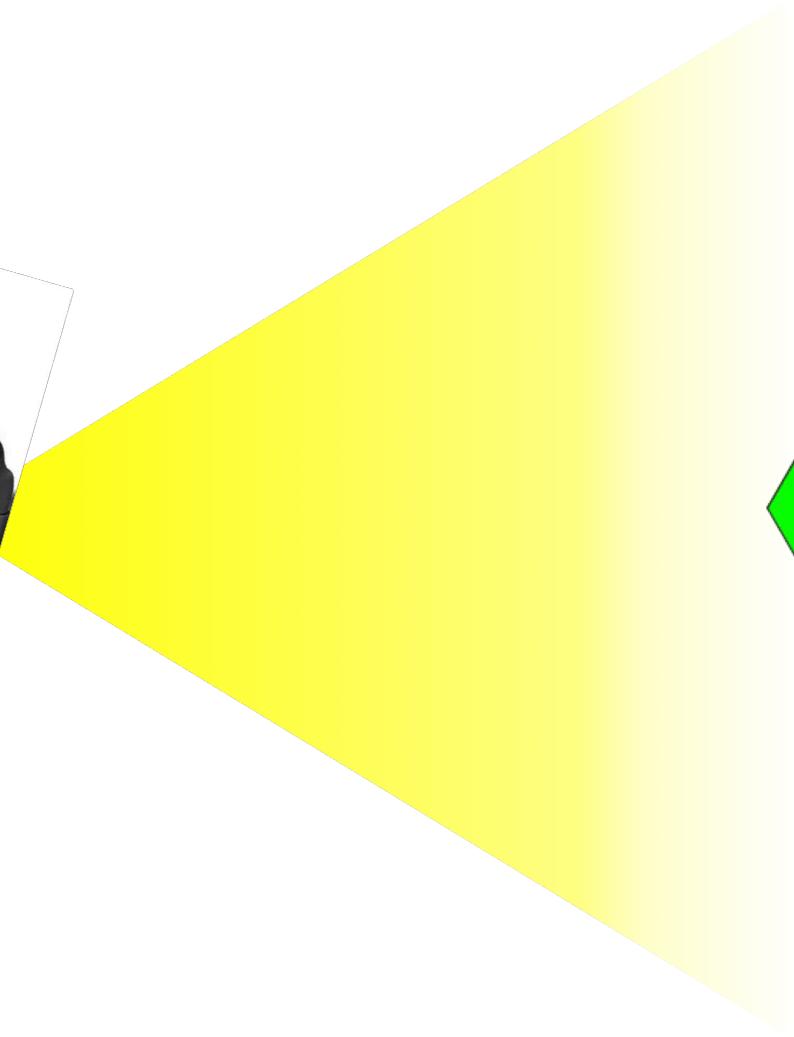
Raster Displays



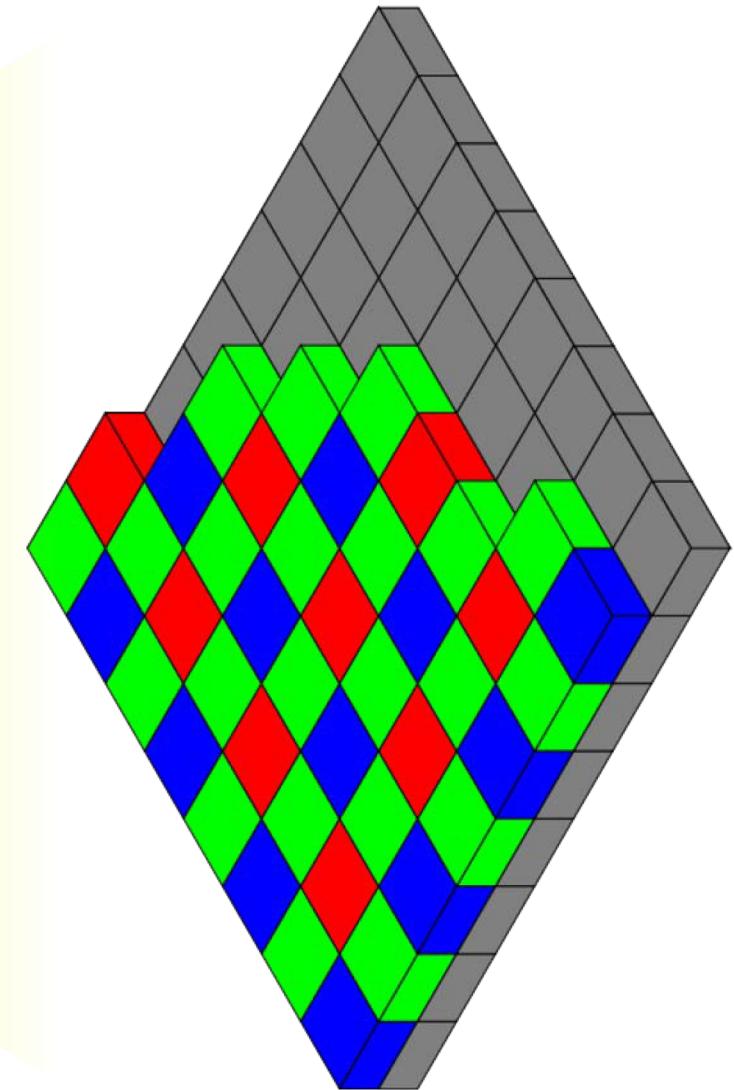
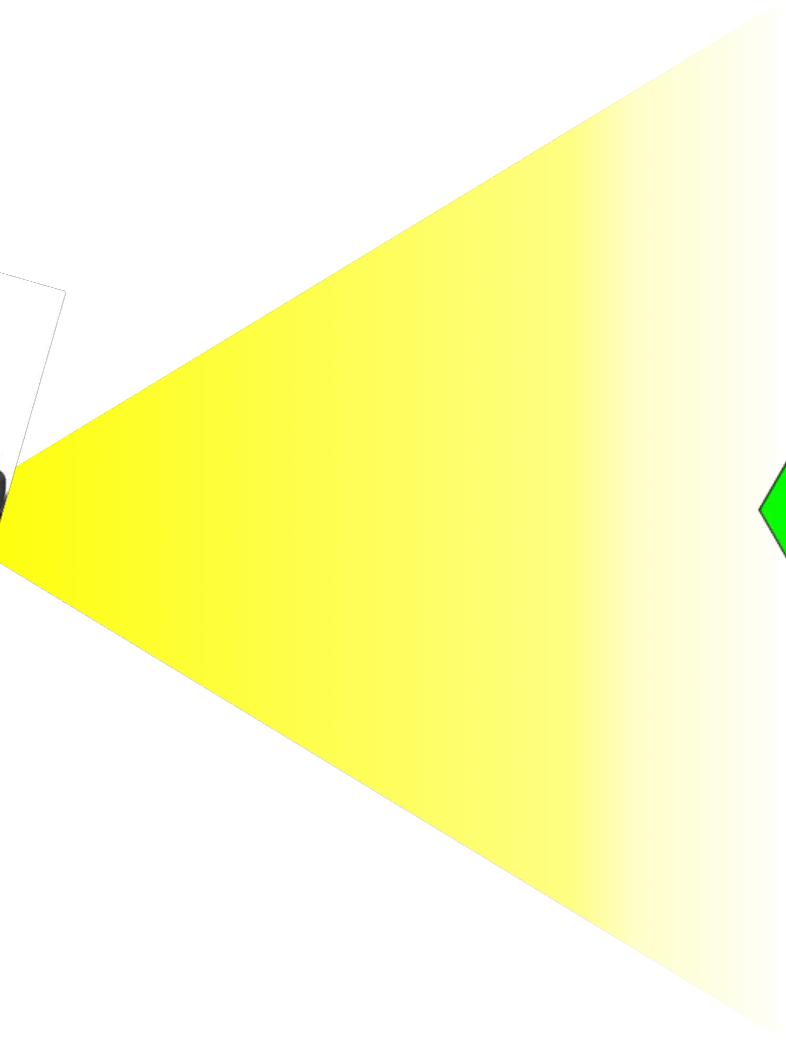
Raster Input Devices



Raster Input Devices

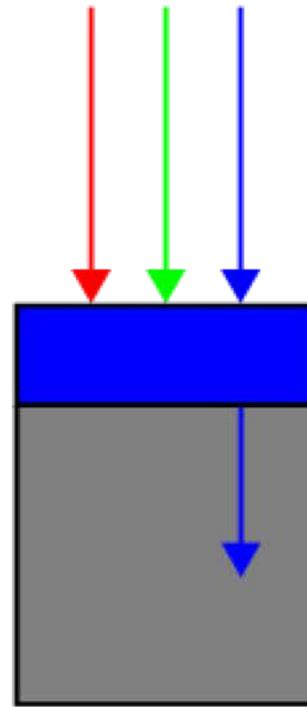
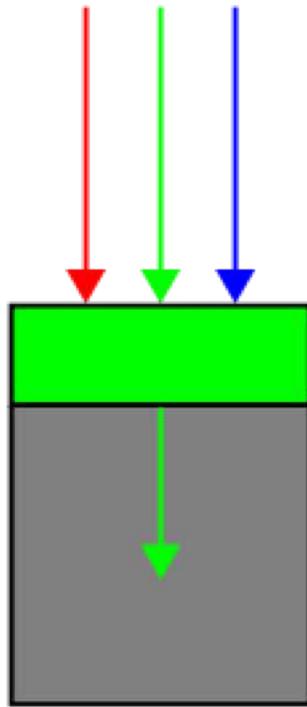
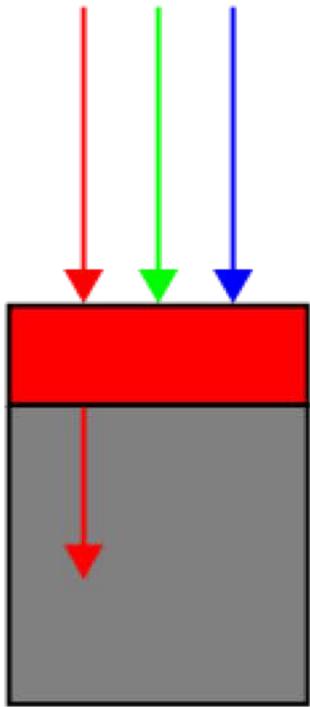


Raster Input Devices



Bayer Filter

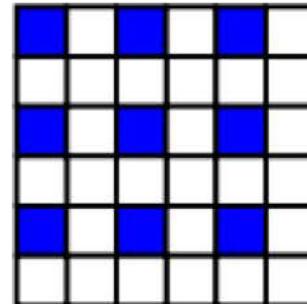
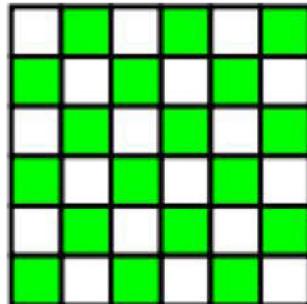
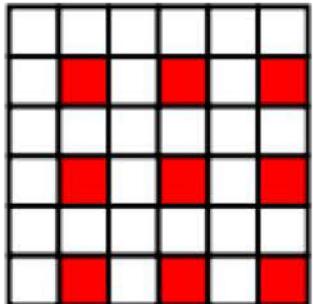
Raster Input Devices



Incoming light

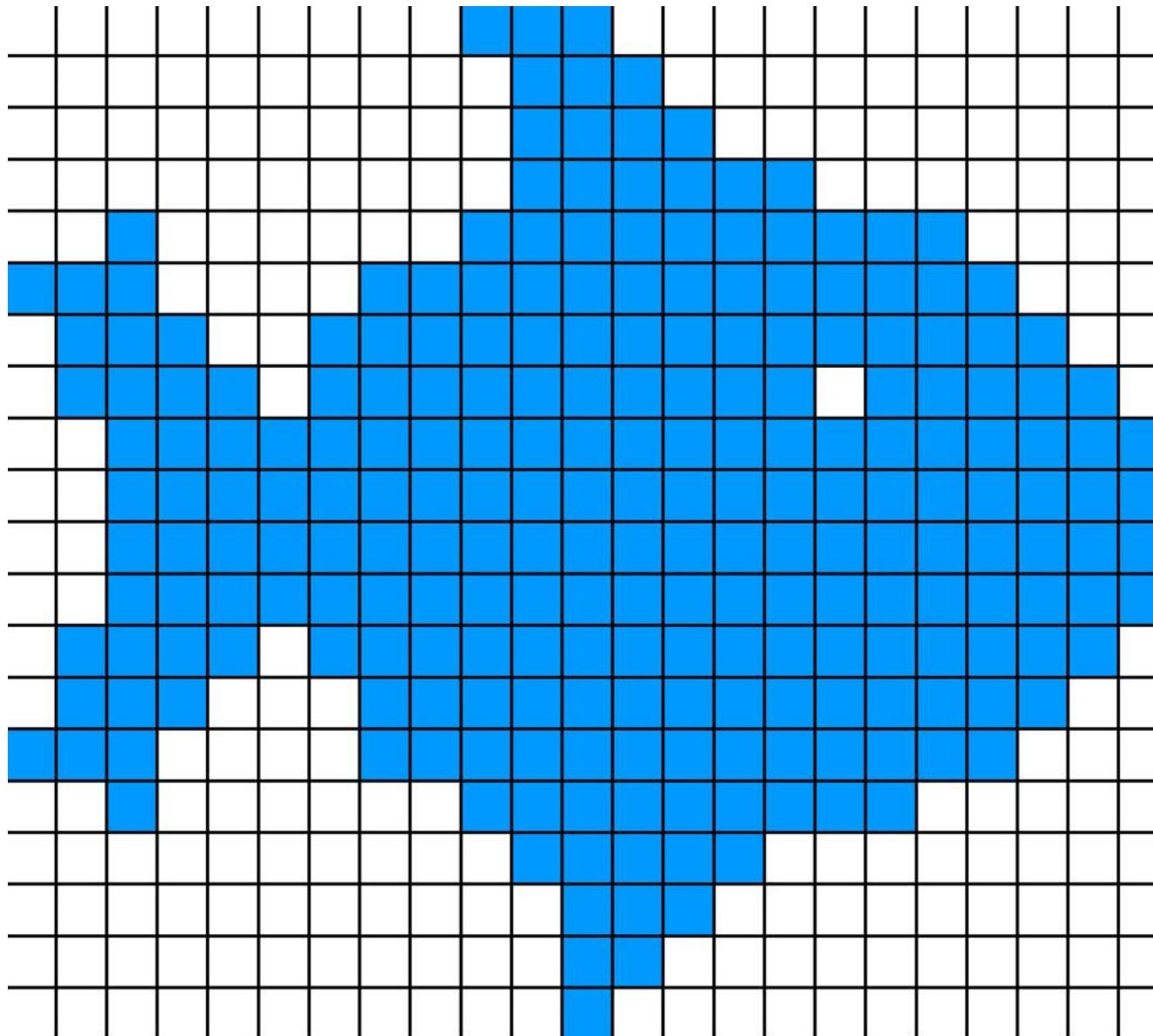
Filter layer

Sensor array



Resulting pattern

Raster Image



Aside: More Than Just Raster Images

painting with pixels



drawing with vectors

