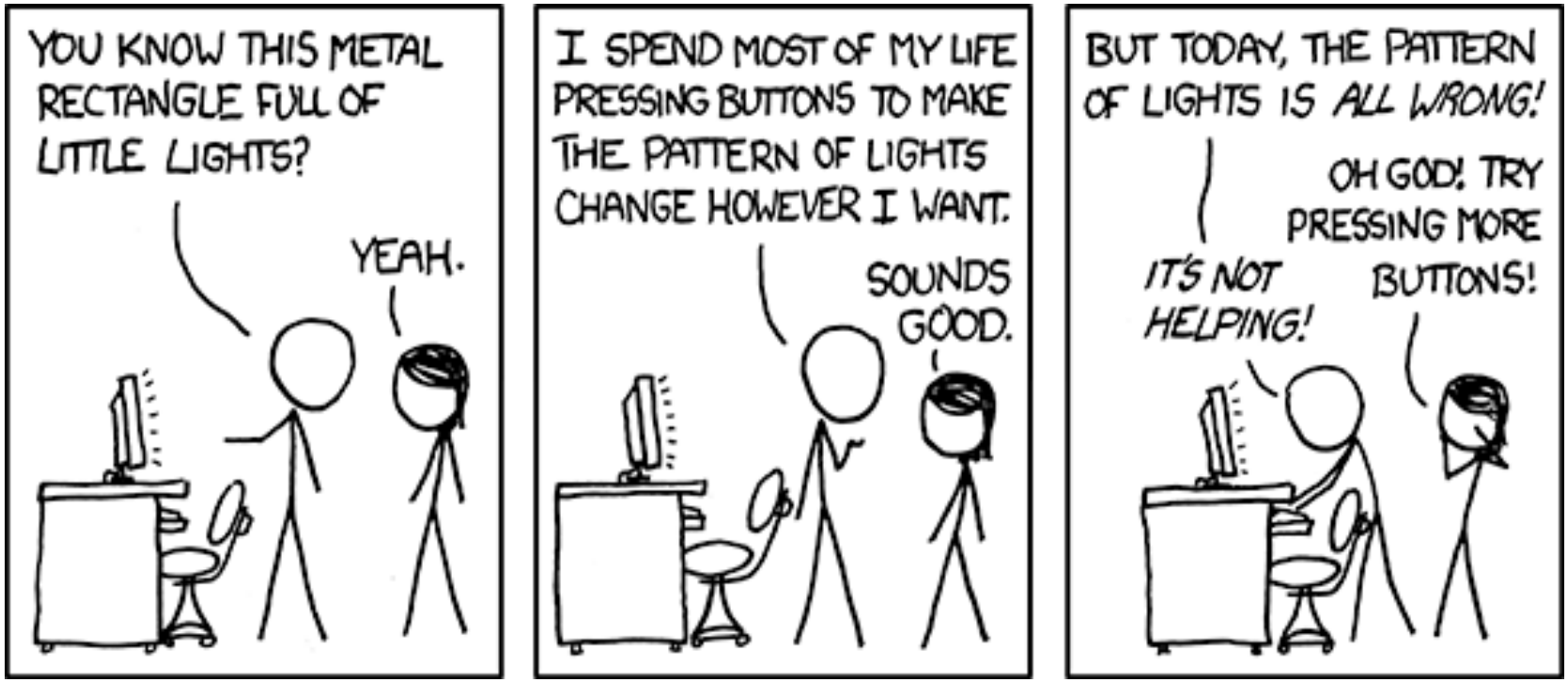
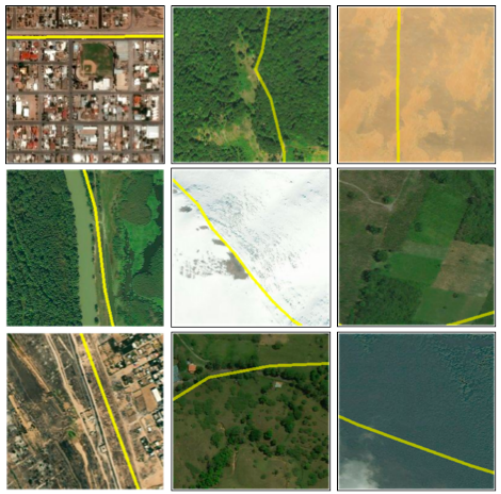
CSCI 480 / 580
Computer Graphics

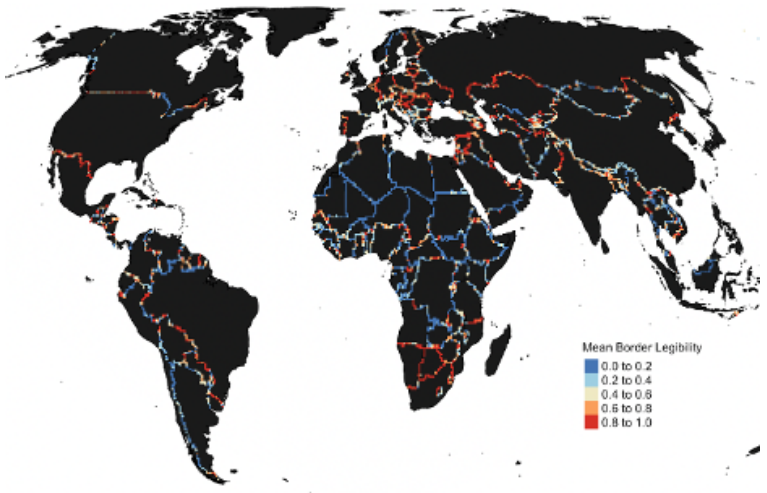


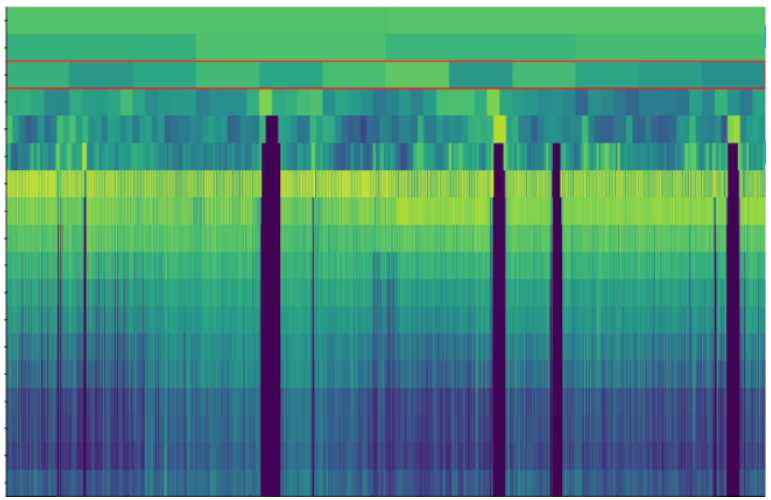
Fall 2024

About Me:

Scott

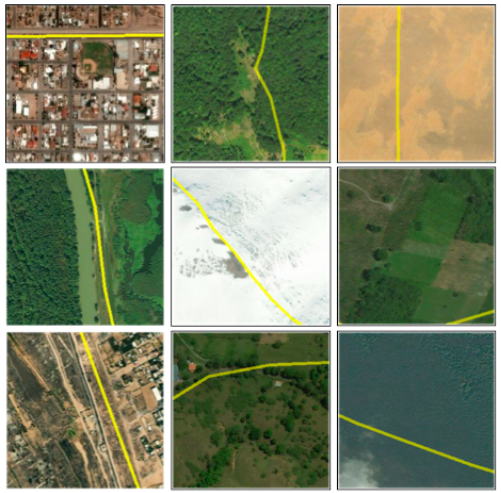
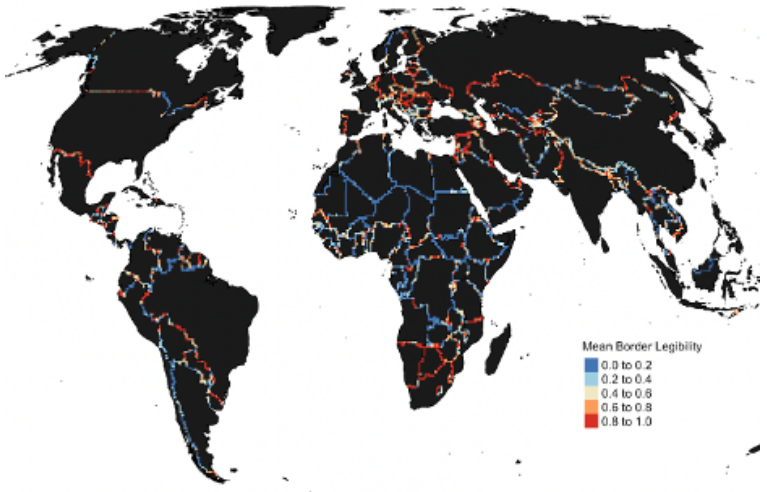


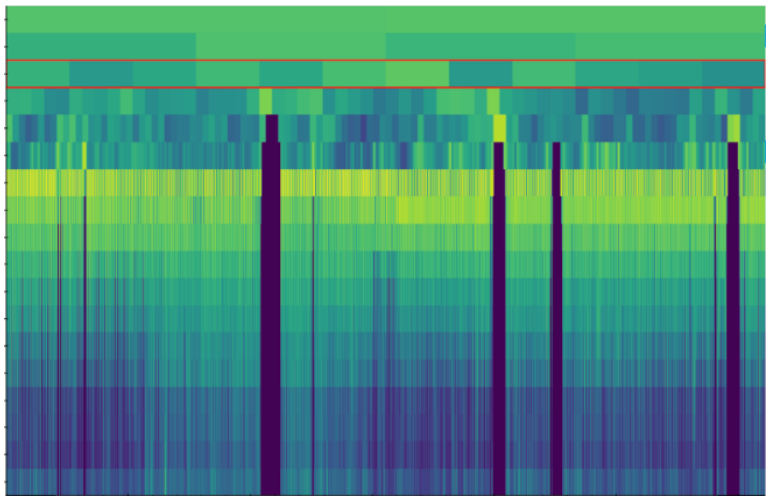




About Me:

Scott Wehr



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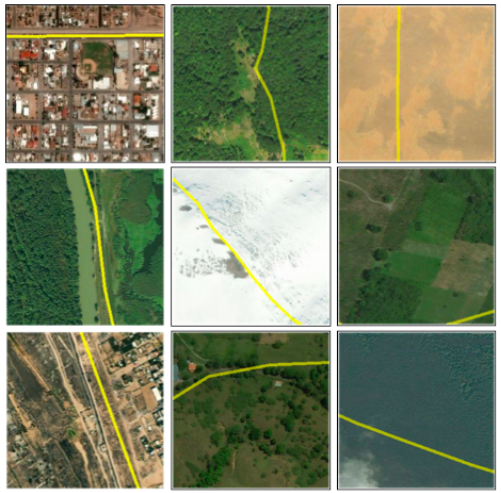
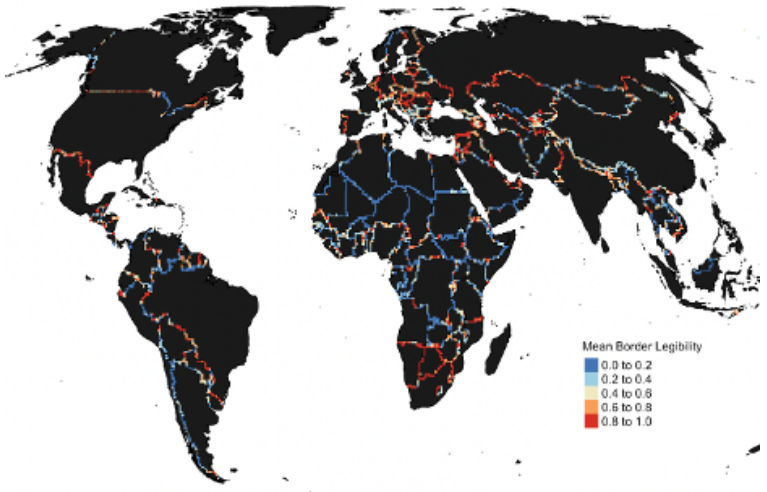

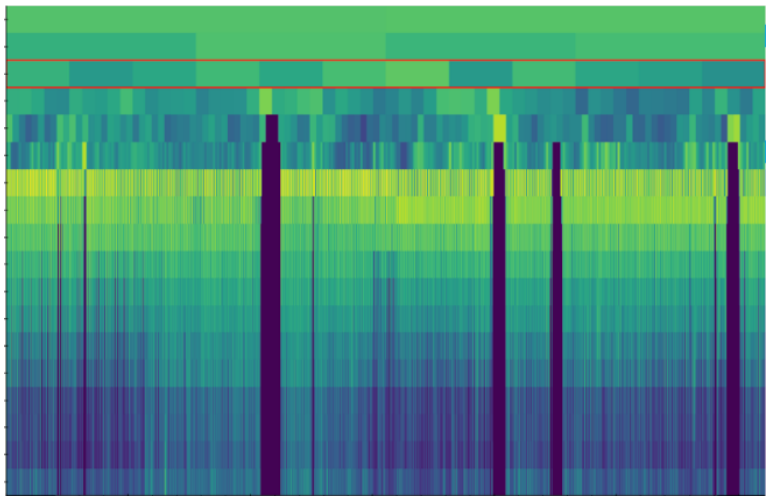

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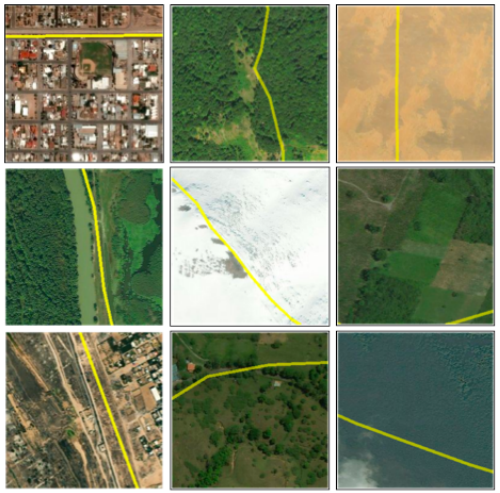

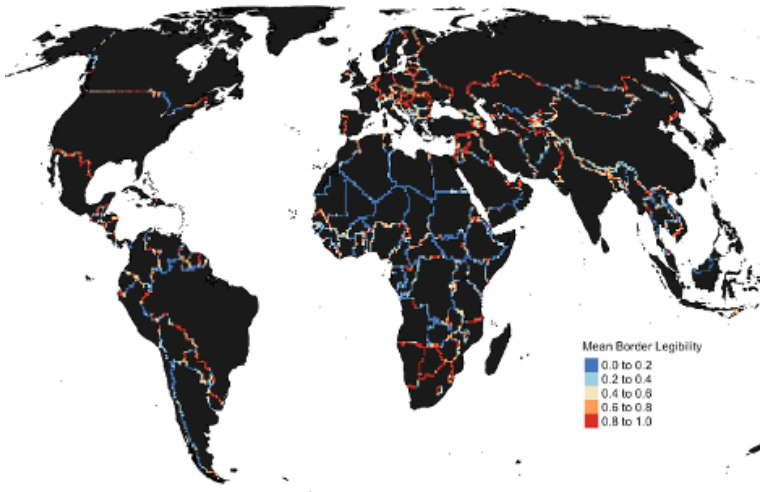

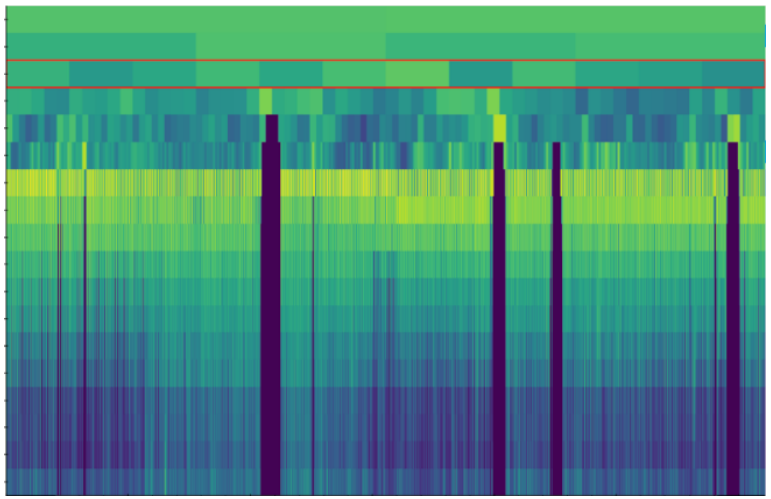

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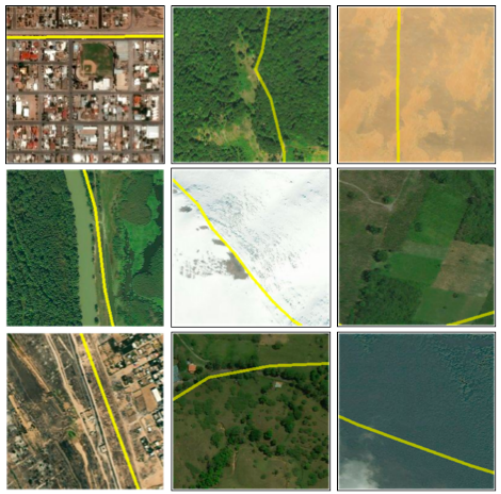
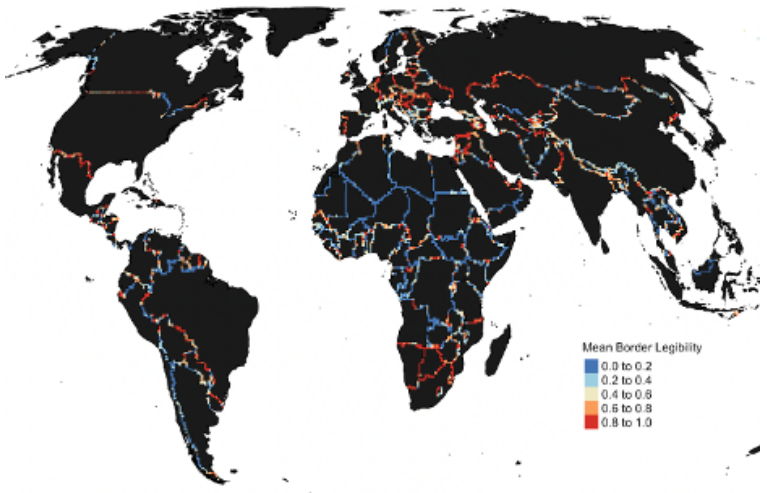
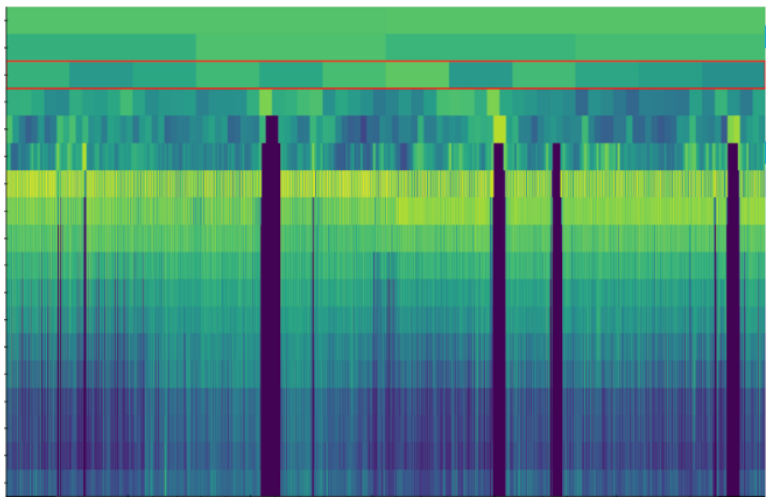
Scott Wehrwein

(call me this!)



About You

A quick survey is available on Canvas, due **tonight** at 10pm.

About you, pt 2

- Fill out a name card (both sides; add pronouns if you like)
- Self-organize into groups of 3-4. Meet your group members and discuss:
  - What was your favorite thing you did this summer?
  - What are you looking forward to this fall (in this course or otherwise)?
  - **What single word or phrase comes to mind when you think about computer graphics?**

Be prepared to share one of your group's words or phrases.
The person who woke up earliest today is the group’s pokesperson.

Pixels

Video games +

Triangles ++

Math

Rendering

Shaders

Quads

OpenGL

3D Models

Runtime Complexity

RTX on

What is Computer Graphics?

Presenting info visually on a computer

Organizing data s.t it displays recognizable

Magic tricks (depth on a flat screen)

What is computer graphics?

A definition:

The study of creating, manipulating, and using visual images in a computer.

What is computer graphics?

The latest and greatest - SIGGRAPH

- SIGGRAPH 2024
- SIGGRAPH Asia 2023
- Much more on the SIGGRAPH youtube channel: https://www.youtube.com/@ACMSIGGRAPH

What is computer graphics?

Areas:

- Imaging
  - 2D: photography, image processing, compositing
  - 3D: texture mapping, volume imaging
- Modeling
  - 2D: page description (e.g. PDF), typography, user interfaces
  - 3D: objects, characters, scenes
- Rendering
  - 2D: drawing shapes, motion blur, simulating art materials
  - 3D: realistic rendering; non-photorealistic rendering
- Animation
  - 2D: user interfaces, titles, 2D animated films, 2D games
  - 3D: technical illustration, animation, visual effects, games

[slides: Steve Marschner]

Imaging

Alexandre Buisse

[Chuang et al. 2001 website]

2D Modeling

Thin 9 pt

Pollard's father was a prominent professor of microbiology who often took his family with him to scientific conferences. *At least a dozen Nobel Prize winners attended young Pollard's fourth birthday party*, which was celebrated in Sweden where his father was attending a conference. At Stanford University Pollard was known as a teller of tall tales, but was so well informed and articulate that he "made what might otherwise have been an outlandish series of claims quite convincing". Pollard's Stanford senior yearbook photo listed him as "*Colonel*" Pollard, and he reportedly convinced almost everyone that secret intelligence was paying his fees.

Light 9 pt

At one point, Pollard received permission to establish a back-channel contact with South African intelligence through a South African friend

All weights 75 pt

Sierra

India

Lima

Alpha

Sierra

Regular 9 pt

Bold 9 pt

FS Silas Slab

FS Silas Sans

Page 04

Bold 48 pt

THE NUMBERS READ:

ExtraBold 134 pt

83912

Bold 28 pt

83912

Light 8 pt

Der russische Mann.
Familie 1 Unterfamilie A
KGB/FSB/GRU
[Die 00000-Familie]

Bold 28 pt

10080

Bold 36 pt

10080 46543 46543
— 257 257 143 143 —

Regular 6 pt

Enigma-ID: 506
Frequenzen: Diverse
Status: Aktiv
Stimme: männlich, autom

Regular 6 pt

Übertragungsart: USB + Kurier
Ort: Russland
Bekannte Referenzstationen:
E06, E17, GD6, V06, V23, M14, M24

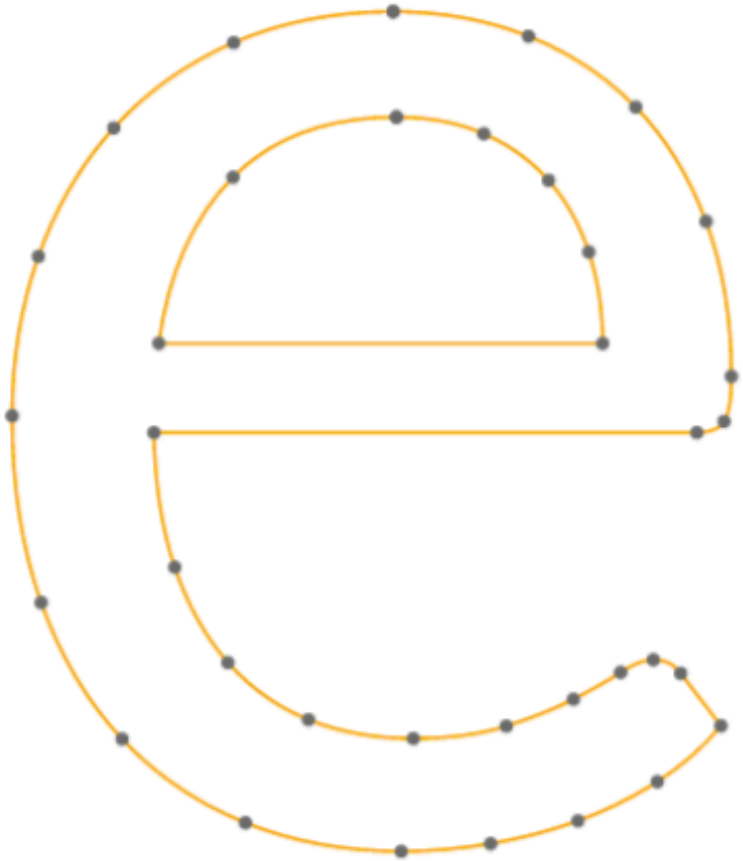
Extra Bold 110 pt

00000

FS Silas Slab

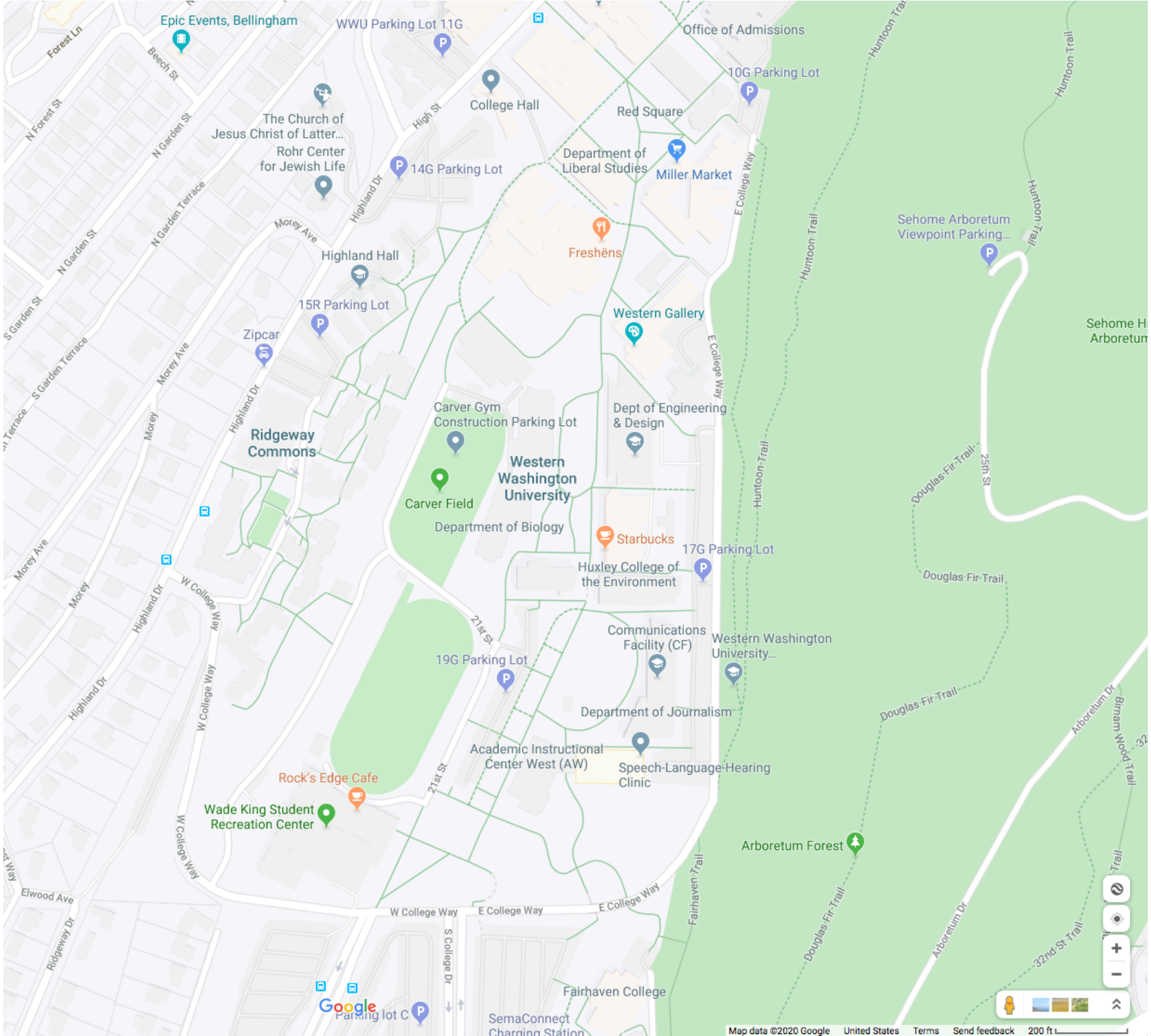
FS Silas Sans

Page 05



Pavithra Solai, kint.io

2D Rendering


Epic Events, Bellingham
WWU Parking Lot 11G
Office of Admissions
10G Parking Lot
College Hall
Red Square
The Church of Jesus Christ of Latter...
Rohr Center for Jewish Life
14G Parking Lot
Department of Liberal Studies
Miller Market
Freshëns
Sehome Arboretum Viewpoint Parking...
Highland Hall
15R Parking Lot
Zipcar
Western Gallery
Carver Gym Construction Parking Lot
Dept of Engineering & Design
Ridgeway Commons
Western Washington University
Carver Field
Department of Biology
Starbucks
17G Parking Lot
Huxley College of the Environment
Communications Facility (CF)
Western Washington University...
19G Parking Lot
Department of Journalism
Academic Instructional Center West (AW)
Speech-Language-Hearing Clinic
Rock's Edge Cafe
Wade King Student Recreation Center
Arboretum Forest
Fairhaven College
Google Parking lot C
SemaConnect Charging Station
Forest Ln
Beech St
N Forest St
N Garden St
N Garden Terrace
High St
Highland Dr
Morey Ave
S Garden St
S Garden Terrace
Morey
W College Way
E College Way
21st St
Elwood Ave
Ridgeway Dr
S College Dr
Huntoon Trail
Douglas Fir Trail
25th St
Arboretum Dr
Birnam Wood Trail
32nd St Trail
Fairhaven Trail
Map data ©2020 Google
United States
Terms
Send feedback
200 ft

3D Modeling

U. of Utah—Alpha 1

Richard Fox, rfoxart.com

3D Animation

Pixar—*Toy Story*

3D Rendering

The Hobbit: An Unexpected Journey (New Line Cinema, 2012)—visual effects by Weta Digital

The syllabus **is** the course webpage:

https://facultyweb.cs.wwu.edu/~wehrwes/courses/csci480_24f

This link can also be found on the Syllabus page on Canvas.

CSCI 480/580 - Computer Graphics

Scott Wehrwein

Fall 2024

- Course Overview
- Assessment
- Logistics
- Schedule
- Course Policies
- Resources for Getting Help and Support

Quick Links:

- Course webpage (you are here)
- Canvas
- Feedback

Course Overview

What is this course about?

Primarily: **modeling** and **rendering** 3D scenes.

Pseudocode for graphics:

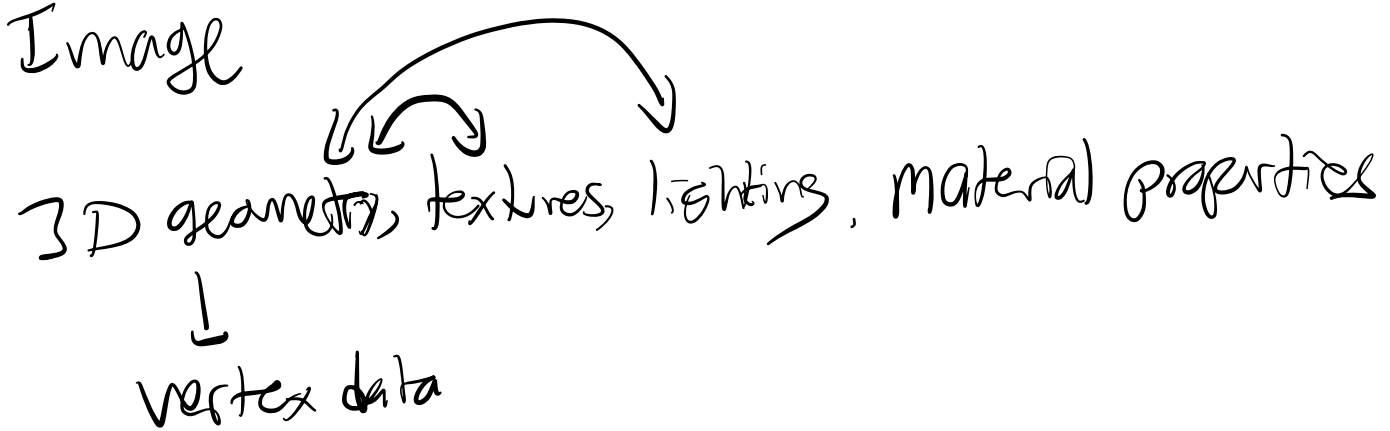
- Create a model of a scene
- Render an image of the scene

Create a Model of the Scene

Storyboard - description

Physical model

Image



Render an Image of the Scene

- What are images?

  2D array of colors (pixels?)

  =

  2D projection of a 3D scene?

- How do we make them?

Two approaches to rendering

Image-order rendering

```
for each pixel:
  for each object:
    if object affects pixel:
      update pixel's color
```

Two approaches to rendering

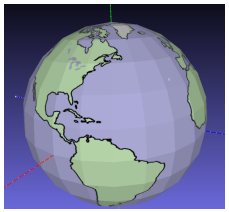
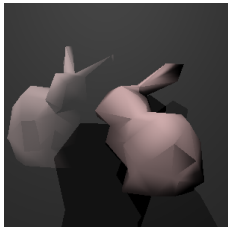
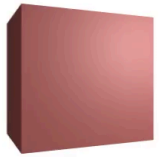
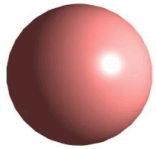
Image-order rendering

```
for each pixel:
  for each object:
    if object affects pixel:
      update pixel's color
```

Object-order rendering

```
for each object:
  for each pixel:
    if object affects pixel:
      update pixel's color
```

High-level course overview

High-level course overview

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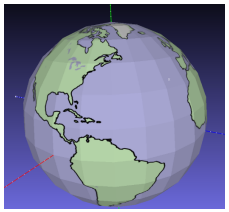
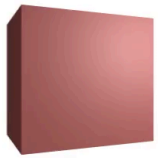
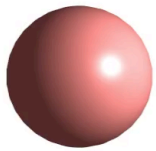
  Draw a triangle on a screen!







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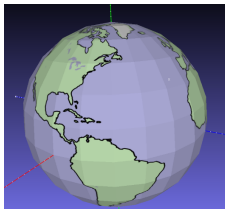

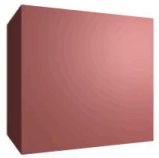
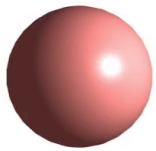

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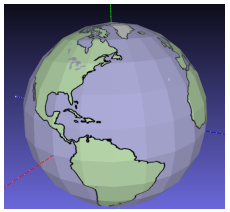

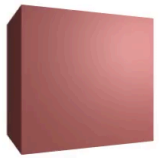
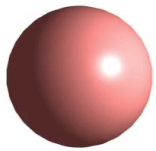

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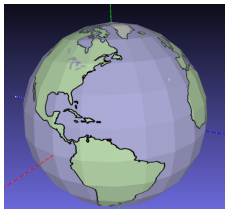
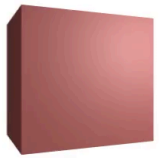
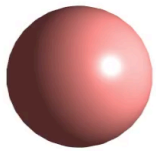
  Program the GPU using WebGL!



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  - Spline curves; parametric surfaces; surfaces of revolution
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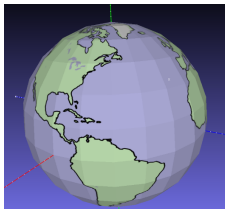

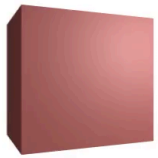
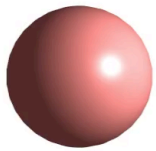

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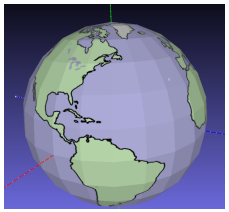

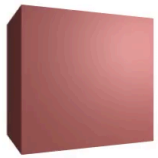
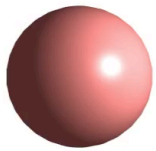

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- **Read the syllabus**
- Bring any questions on syllabus, logistics, etc.

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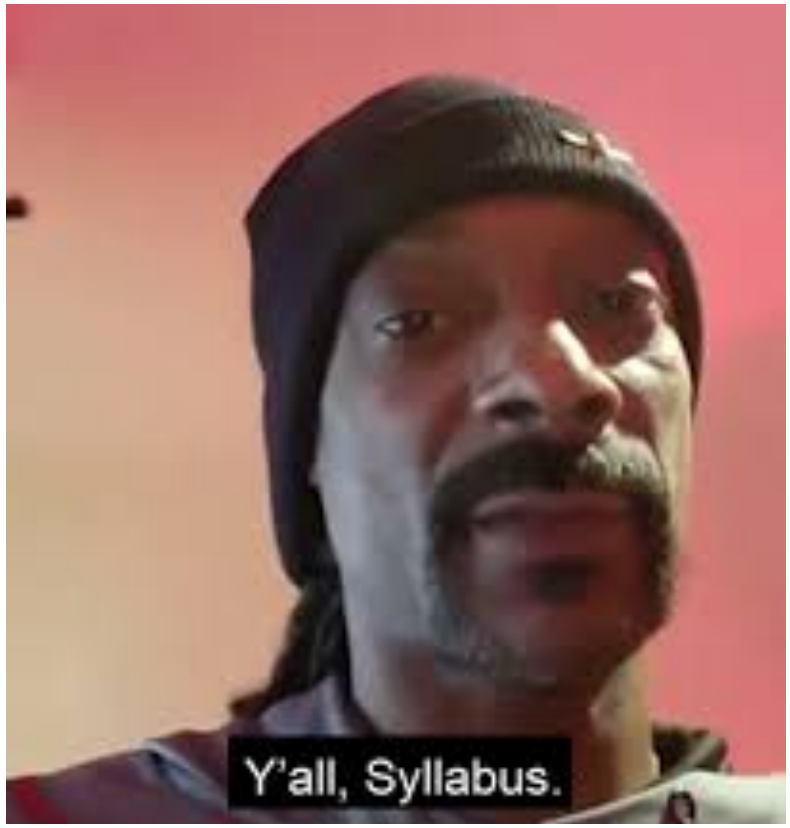
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