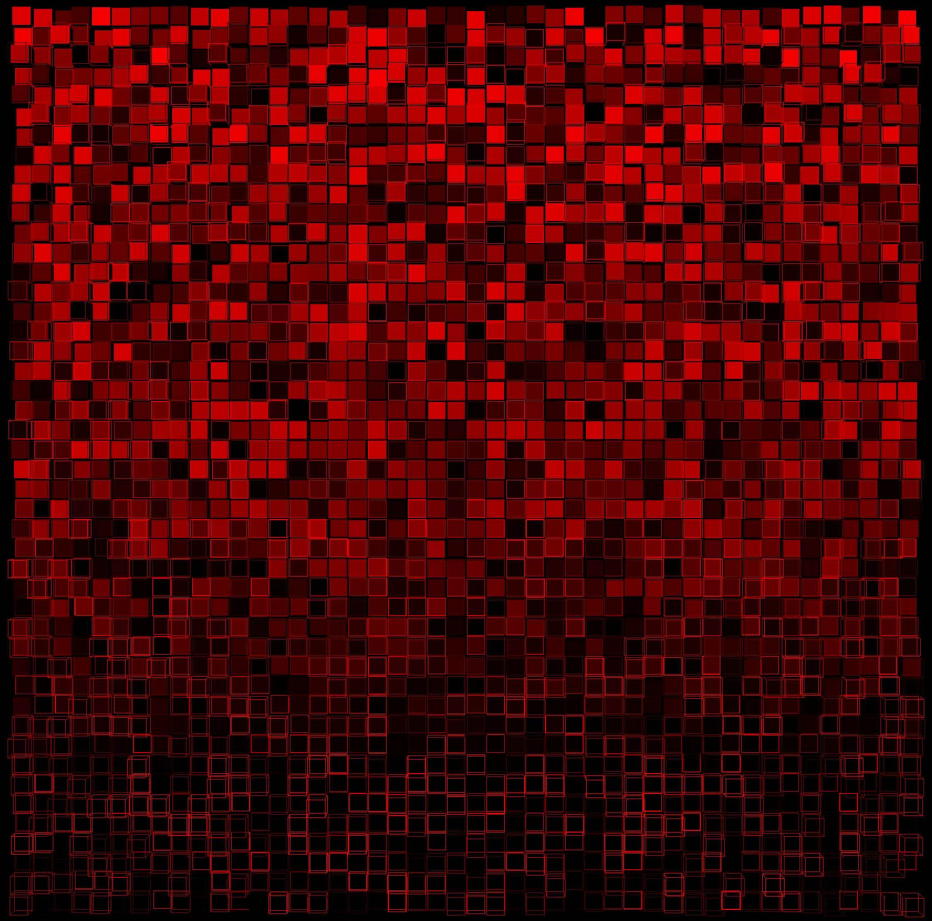
@sam_halperin

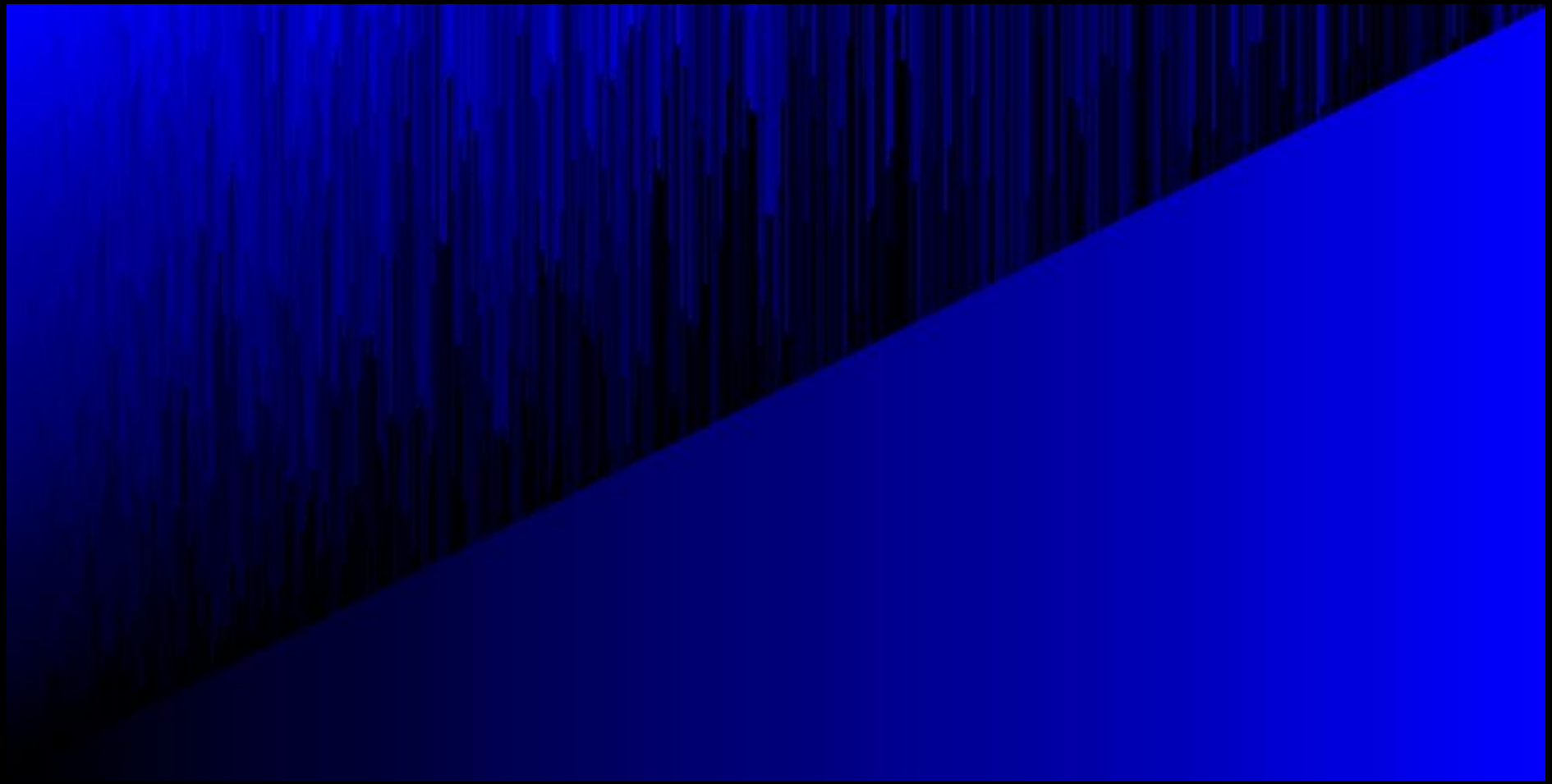
samhalperin.com

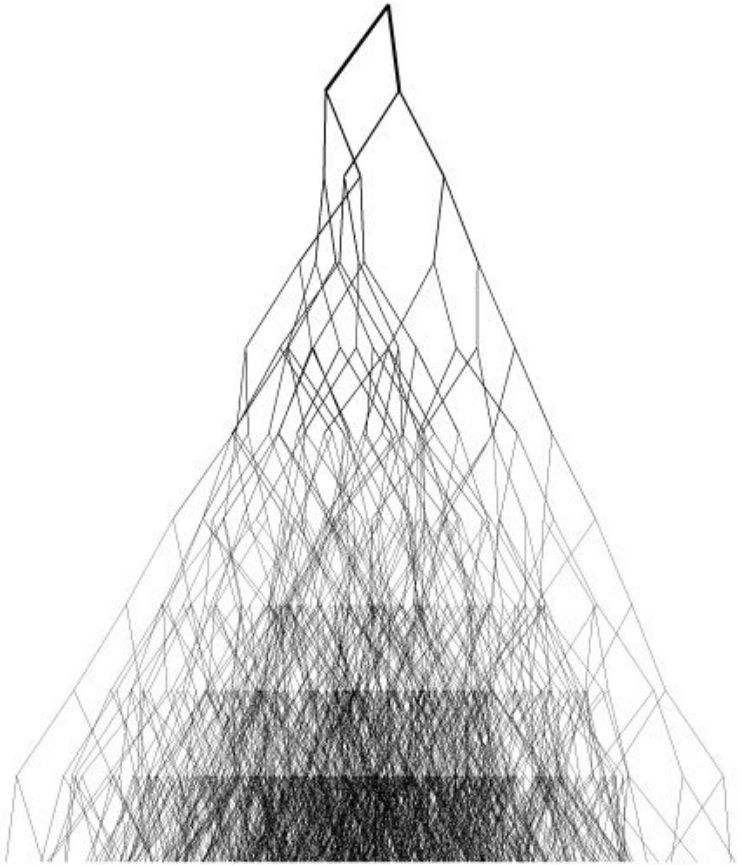
image: cowbird.com

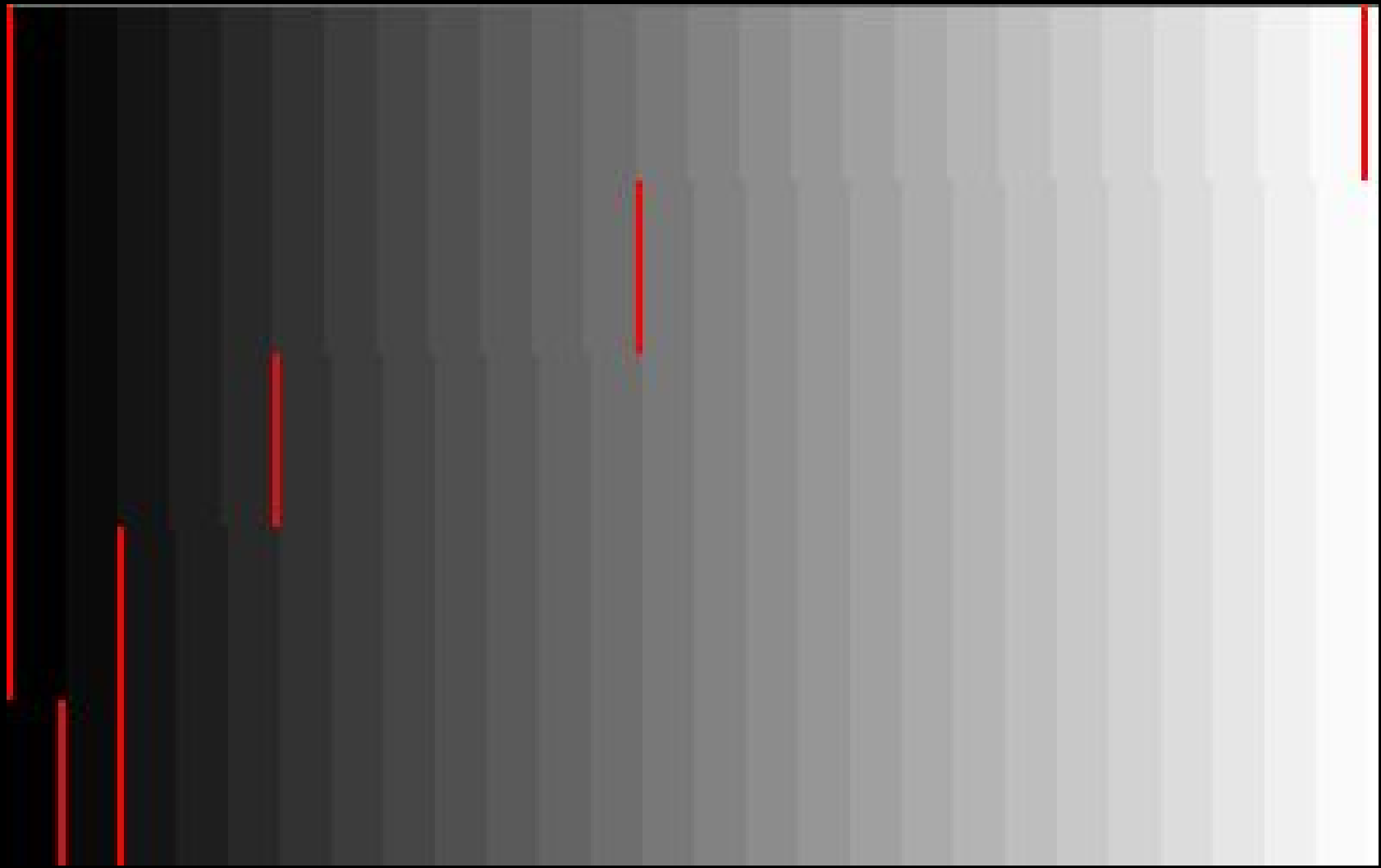
There is a certain class of students for whom visual media is a very strong way, perhaps the only way, to get an early handle on more abstract concepts like functions, objects, and loops.

With a visual toehold on basic data structures and algorithms, they then succeed in more traditional advanced studies.



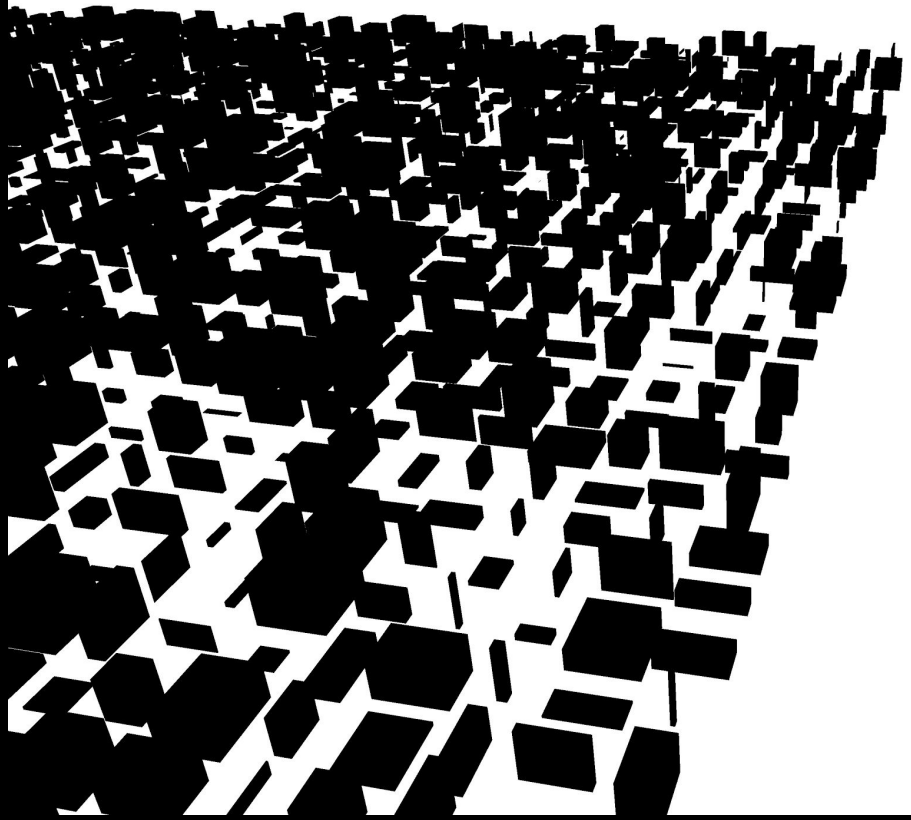


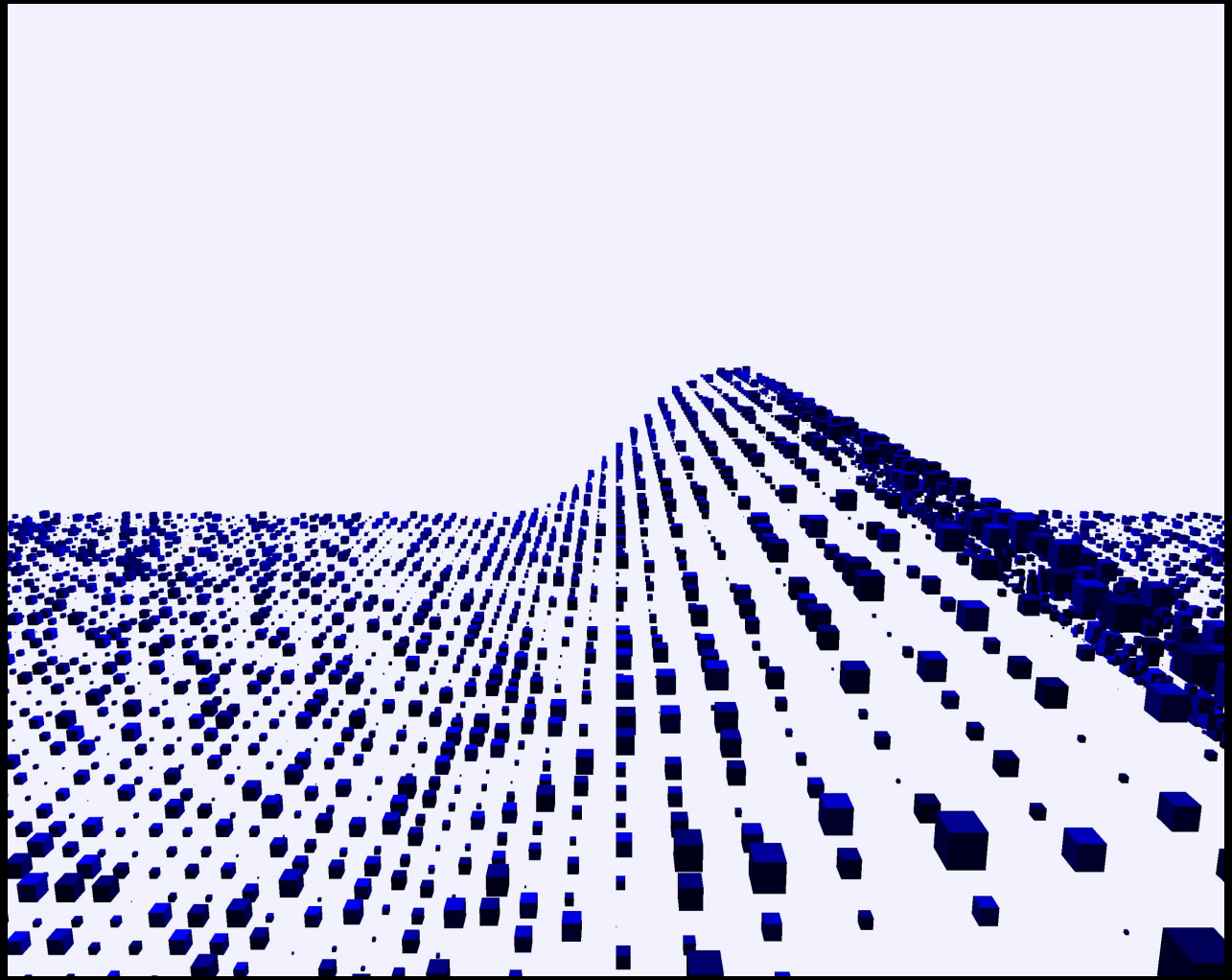




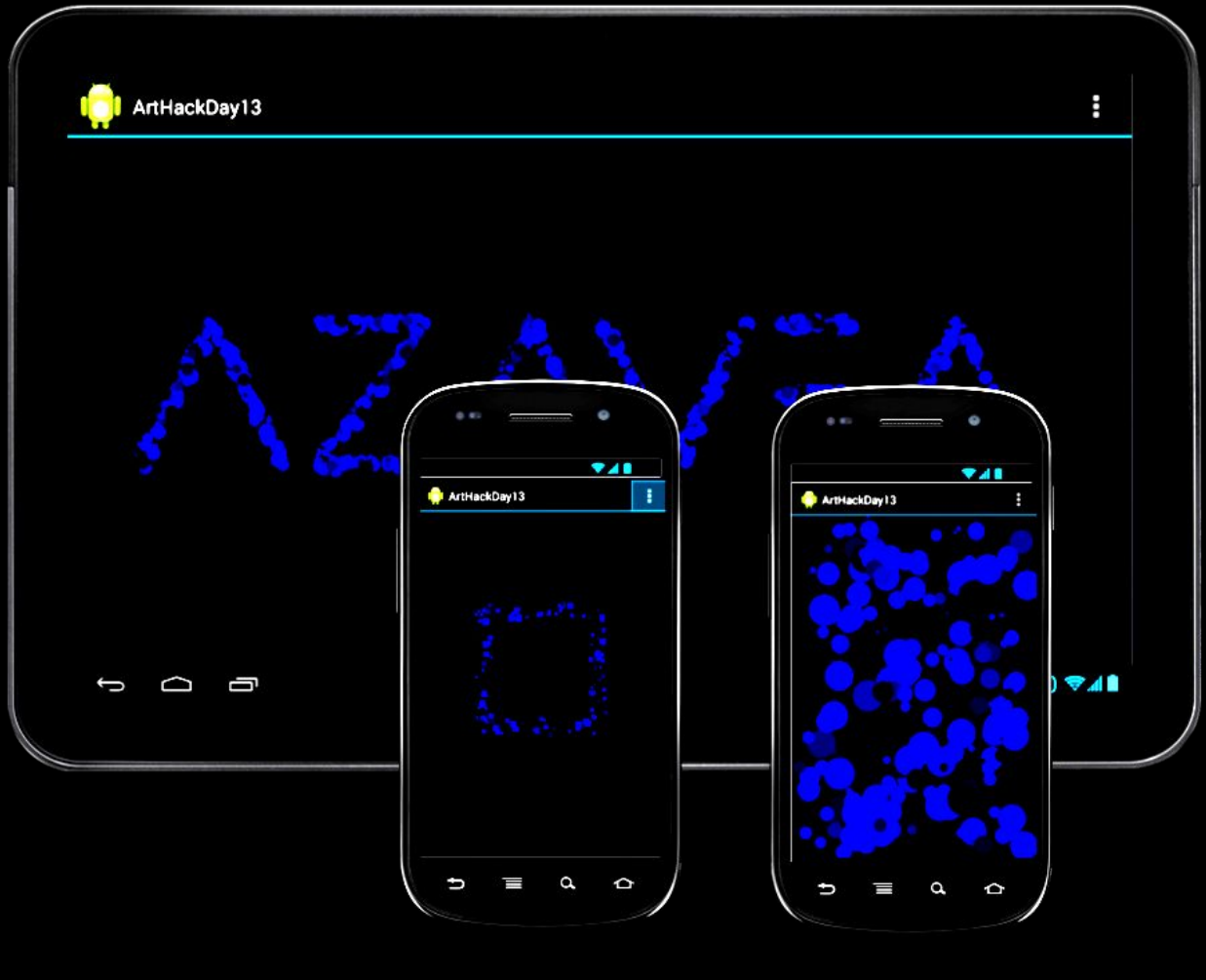
Using computer graphics as a context to learn and teach computer science.

1) **Avoiding callbacks, asynchrony, and complex object orientation.**





2) Commercially / culturally relevant languages and frameworks have more appeal than obscure ones.


ArtHackDay13
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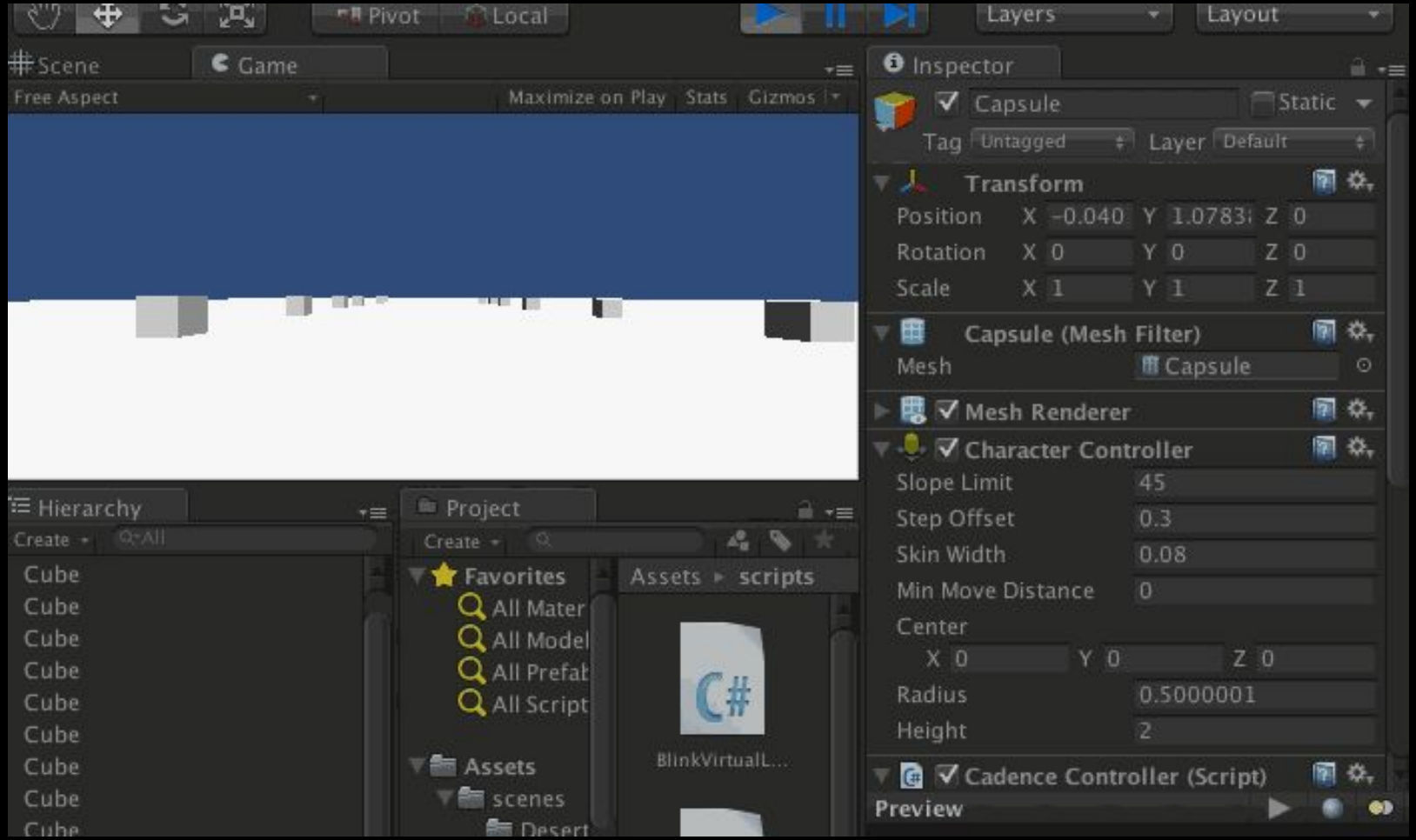
Pivot
Local
Layers
Layout
Scene
Game
Free Aspect
Maximize on Play
Stats
Gizmos
Inspector
Capsule
Static
Tag
Untagged
Layer
Default
Transform
Position
X -0.040
Y 1.0783
Z 0
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Capsule (Mesh Filter)
Mesh
Capsule
Mesh Renderer
Character Controller
Slope Limit
45
Step Offset
0.3
Skin Width
0.08
Min Move Distance
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Center
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Y 0
Z 0
Radius
0.5000001
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2
Cadence Controller (Script)
Preview
Hierarchy
Create
Cube
Project
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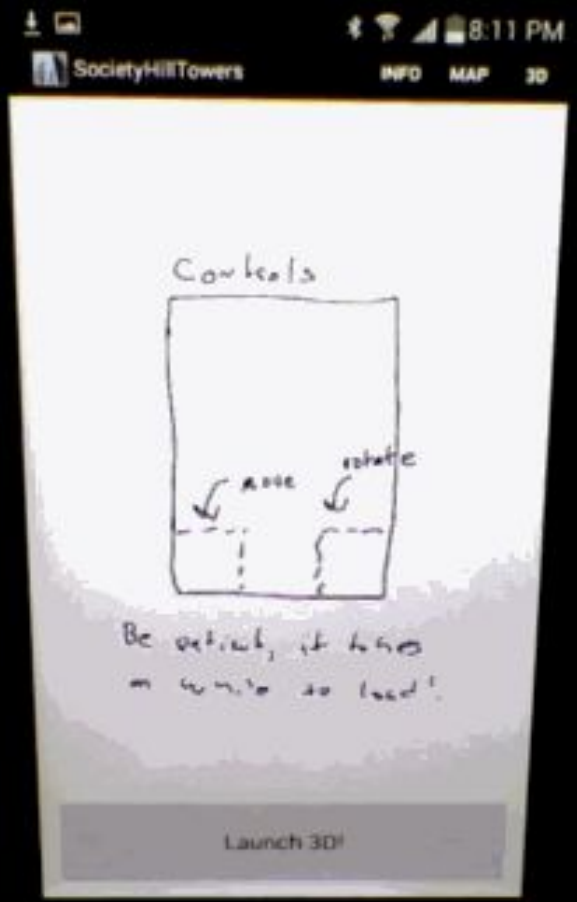
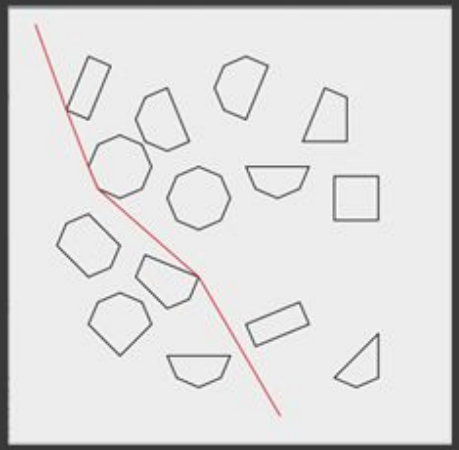
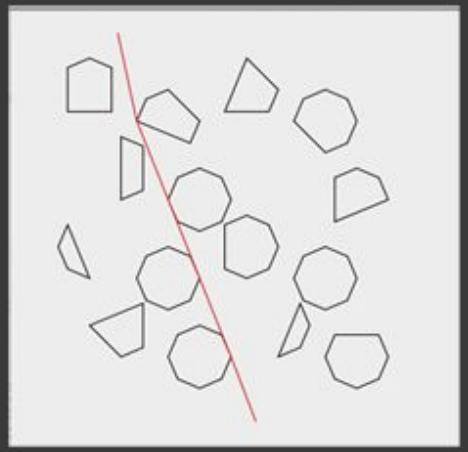
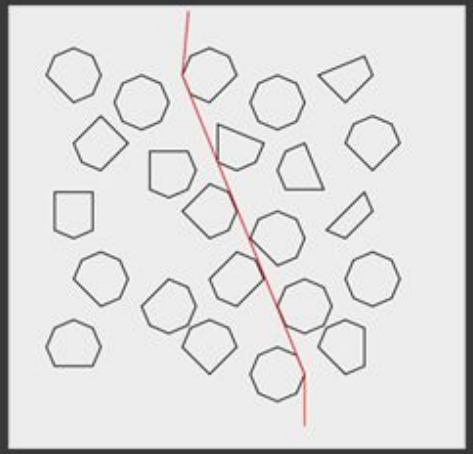
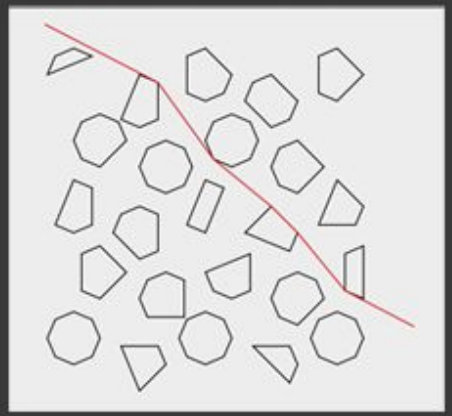
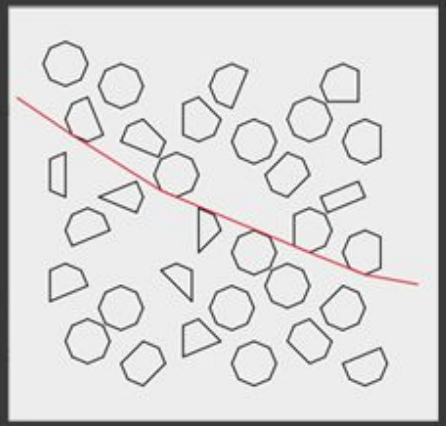
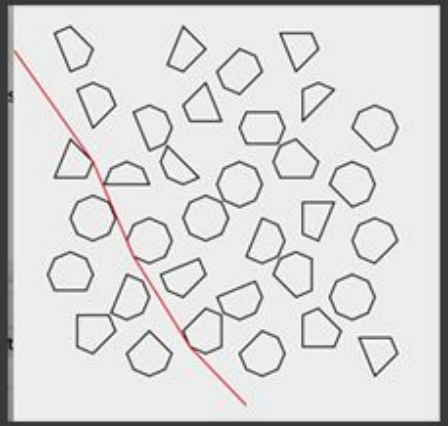
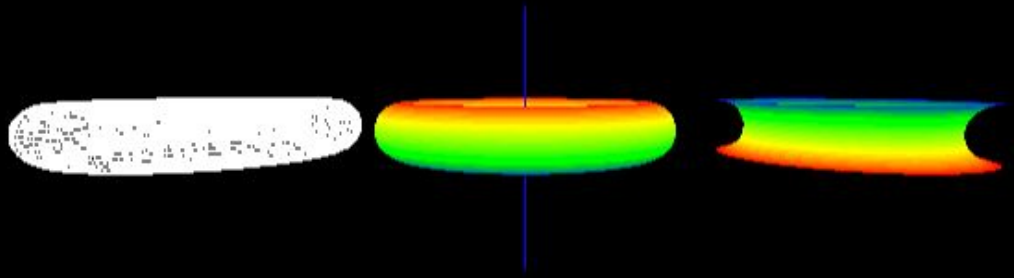

8:11 PM
SocietyHillTowers
INFO
MAP
3D
Controls
move
rotate
Be patient, it takes
a while to load!
Launch 3D!

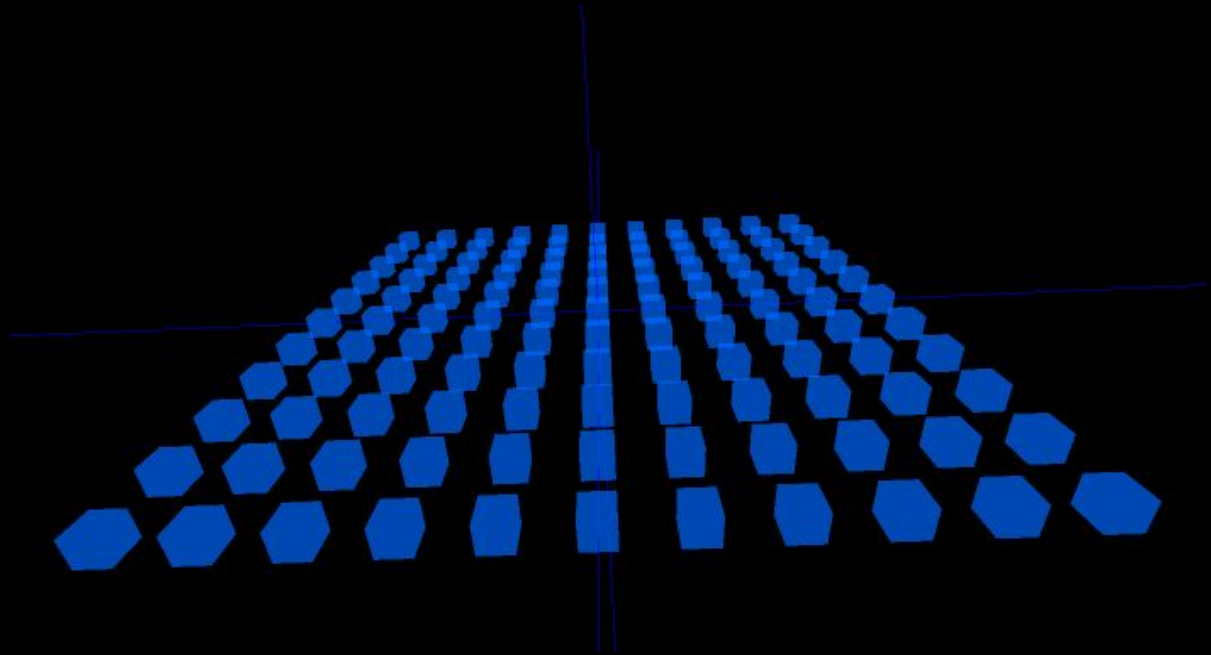
3) The syntax of a person’s first language is their “native syntax”.

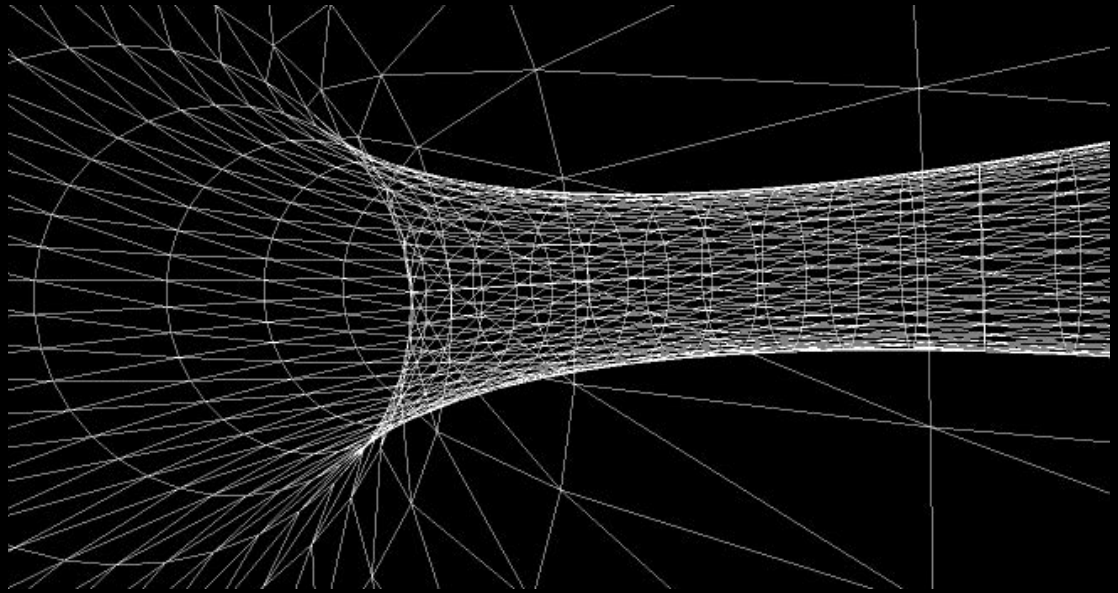







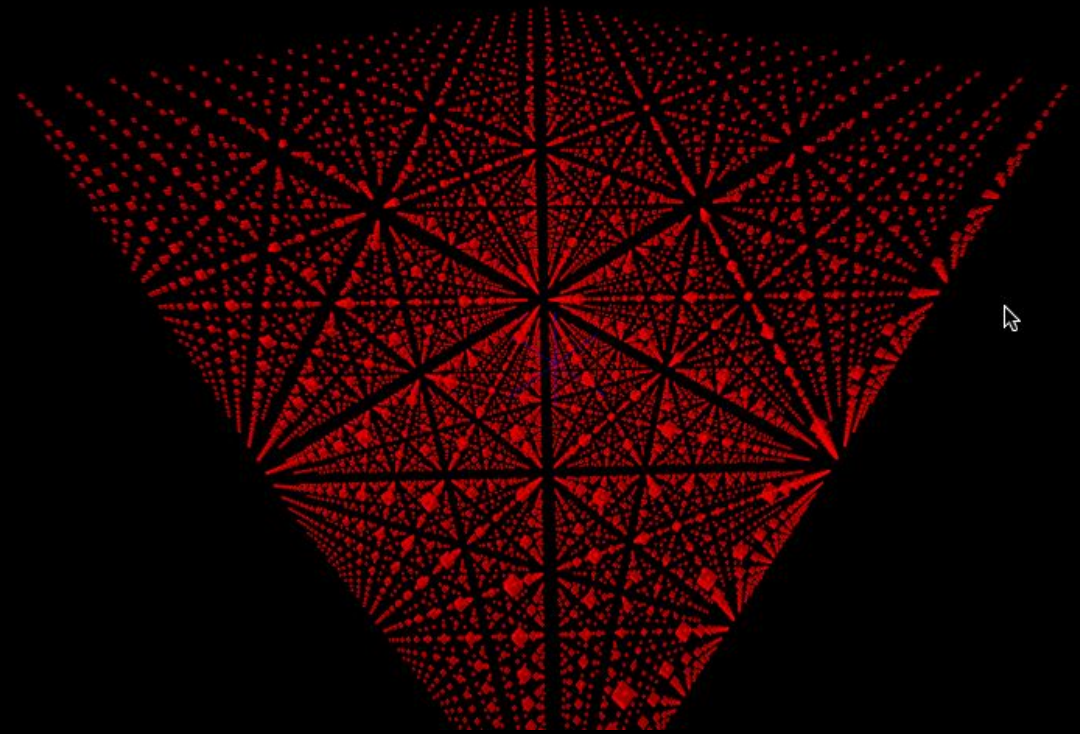
4) “Programming is not the only job skill”, Software Engineering, collaboration and language.
(However, “programmers should win programming competitions.”)

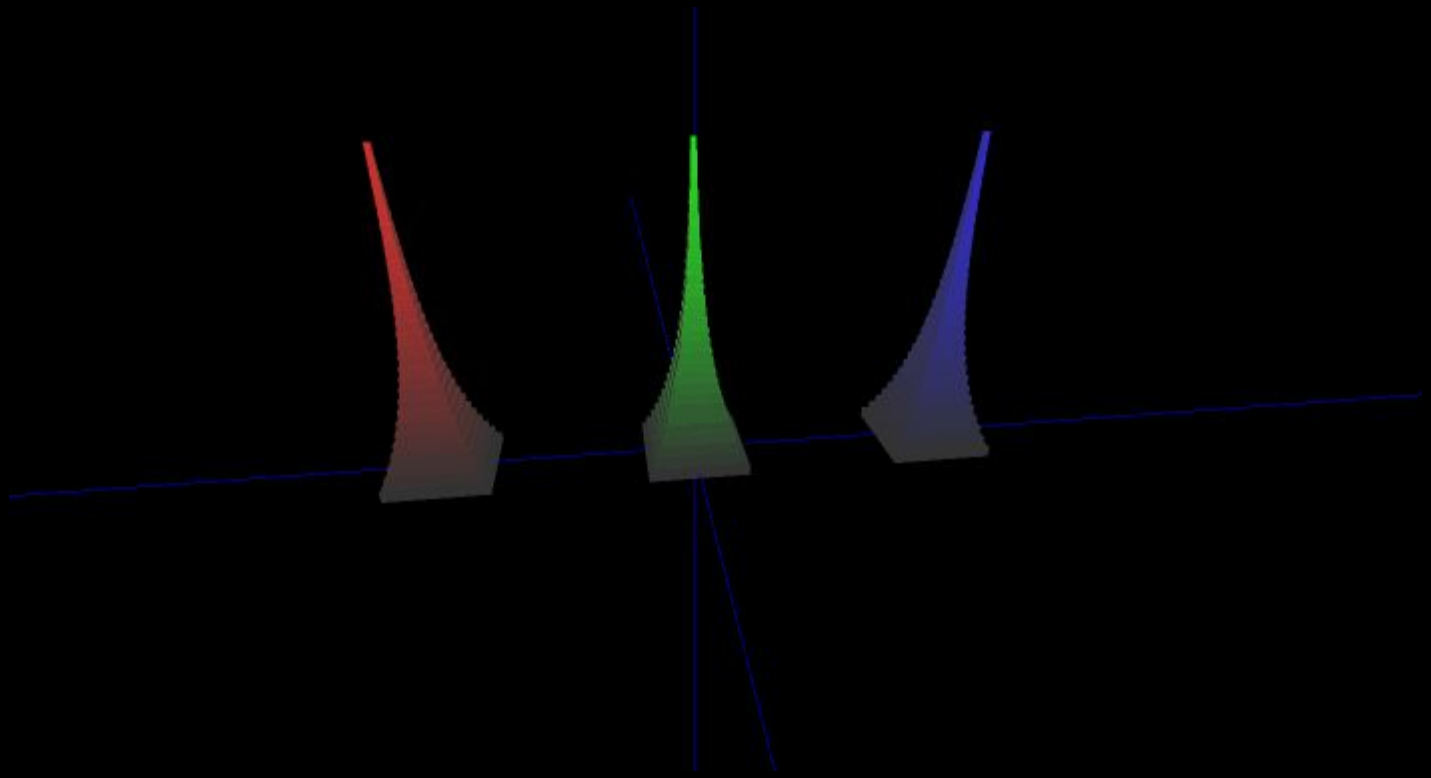
5) Instructor time and expertise are a limited resource.











The Future

+ coding literacy
+ diversity
+ better engineering
+ better science

Thanks

My professors at Penn a million years ago for not just outright slamming the door on my sometimes catastrophic experiments in computation and graphics.

Colleagues and professors at NSU, some of the work here was done in their classes.

The authors of the research that I reviewed and touched on here.

Where to get started

SVG or HTML: generate it with Ruby, Python, JS, by redirecting STDOUT to file. *“python make_image.py > my_image.svg”*

THREE.js (a high level JS graphics library)

Udacity’s Computer Graphics course (problematic auto-grading, but good content)