# Game Project

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# Break-Down

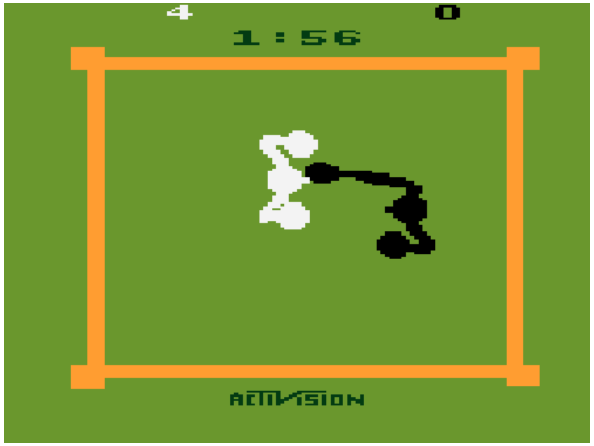
- Scope - demos from last year
- Challenge – multiple demos together
- Challenge – some sort of game framework
- Discussion - features

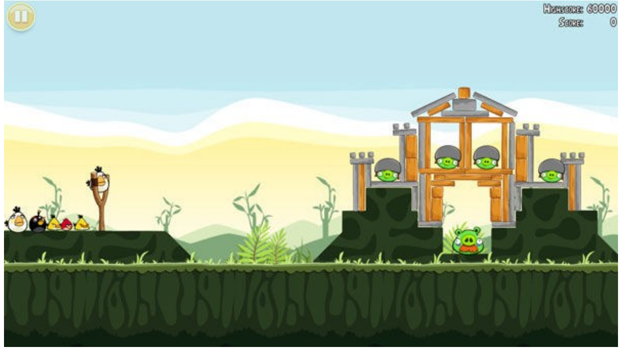
Show Demo Videos Here

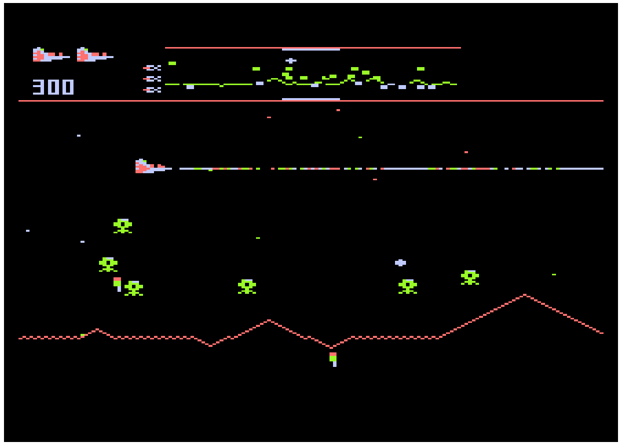
# Features in Demos From Last Year

- Expanding scene
- Cameras, controls, lighting, meshes, animations, etc.
- Sky-boxes
- Height-mapped terrain
- Instruction and win/lose panels
- Score
- Some added sounds and music

# Game Design Ideas – Remakes in 3d







# Programme Structure

- Multiple shaders or one shader for all?
- Multiple mesh files – 1 VAO each
- Multiple textures – know how to bind textures between draw calls
- Figure out a quick and clean-ish structure – don't spend days writing some elaborate design
- Updates versus Drawing – real-time simulation?

# Debugging Instead of Trial-and-Error

- Print shader compile and linking logs
- Add the OpenGL debug extension
- Use a console or write errors to a file
- Know how to visualise variables in shaders

# Debug Callback Extension

- After starting GLEW, check and set up a call-back

```
if (GLEW_KHR_debug) {
  int param = -1;
  printf ("KHR_debug extension found\n");
  glDebugMessageCallback (
    debug_gl_callback, &param);
  glEnable (GL_DEBUG_OUTPUT_SYNCHRONOUS);
  printf ("debug callback engaged\n");
} else {
  printf ("KHR_debug extension NOT found\n");
}
```

# Debug Callback Extension

```
void debug_gl_callback (
  unsigned int source,
  unsigned int type,
  unsigned int id,
  unsigned int severity,
  int length,
  const char* message,
  void* userParam
) {
  fprintf (stderr, “ERROR: dbcb: %s\n”, message);
}
```

- Code to print the other details in my tutorials / Github

# My Game Example

- Demo (hopefully with sound)
- Features
  - Models (very basic)
  - Procedurally generated + random level (started with 2 triangles, x+=rand() each addition)
  - Animation (easy – wheels as in previous lecture)
  - Simulation time-step for updating movement
  - Way-point following (made a list of road ends +- 1 for each side)
  - ...

# My Game Example

- …
  - Camera with focal-point shift (easy and nice trick – change fovy with speed)
  - Rear-view mirror (used a second framebuffer – later lectures)
  - Text (using the little library)
  - Audio with pitch shift (IrrKlang – very easy to use)
  - Gamepad (with GLFW - easy)
  - CGA (the '80s are back!)

# Ask for help/advice

- Game idea vs. time available (only 3 weeks)
- Code structure #VAOs, binding, swapping textures...
- Graphics features vs. how long they'll take
- Bugs