



# SymoEngine 2.0

Graphical engine

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# Version history

## 1.0

- OpenGL 2.0
- SDL 1.2
- Unorganized code (5000 lines)
- Inflexible

## 2.0

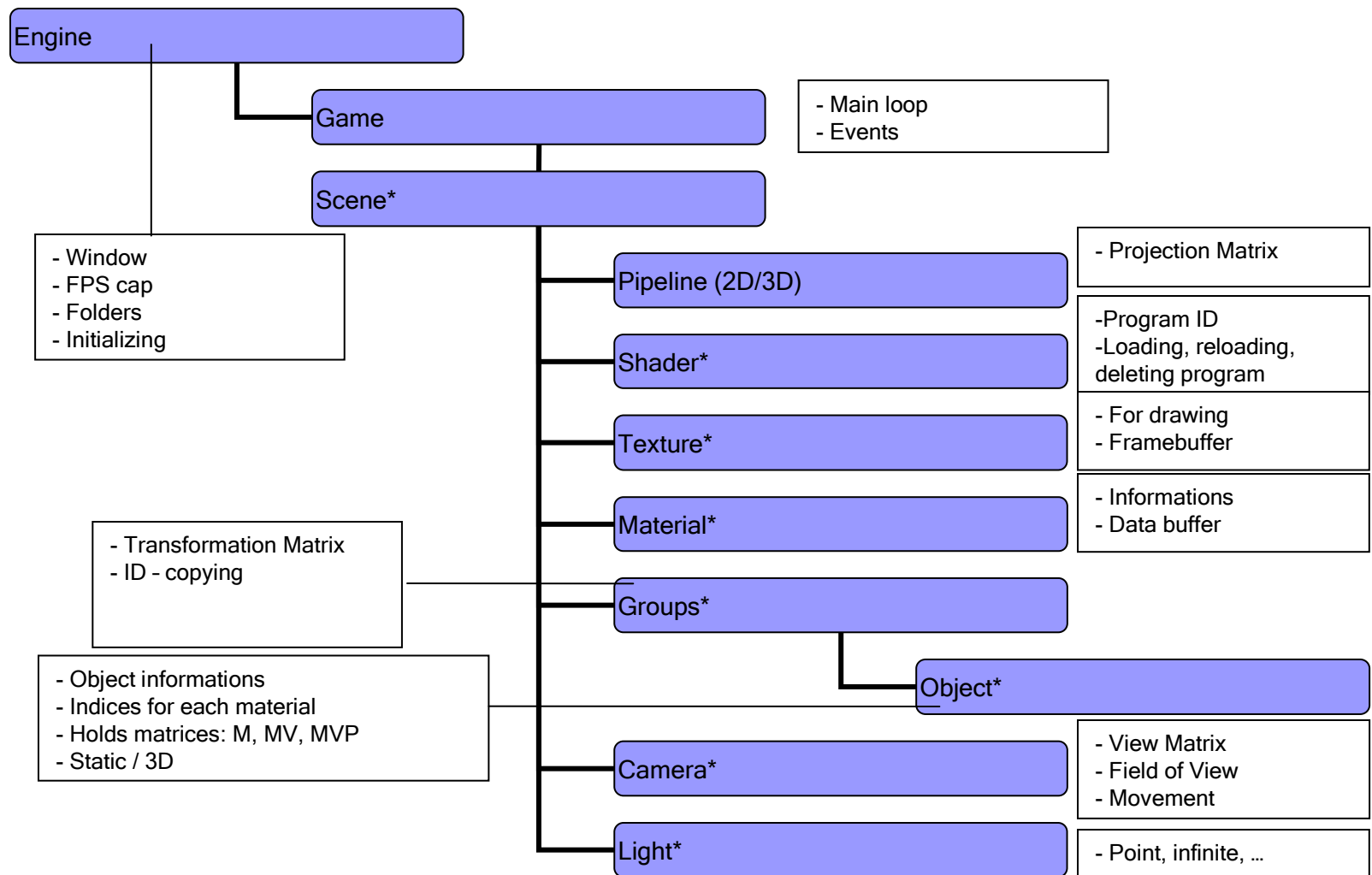
- OpenGL 3.3+
- SDL 2
- GLM
- Nested classes
- Configuration files
- Flexible



# Major changes

- Object Oriented Design
- Replaced fix-function matrices - GLM
- 3-way pipeline
- Parametric scenes - configuration file
- Material to Object drawing

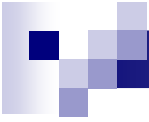
# Structure



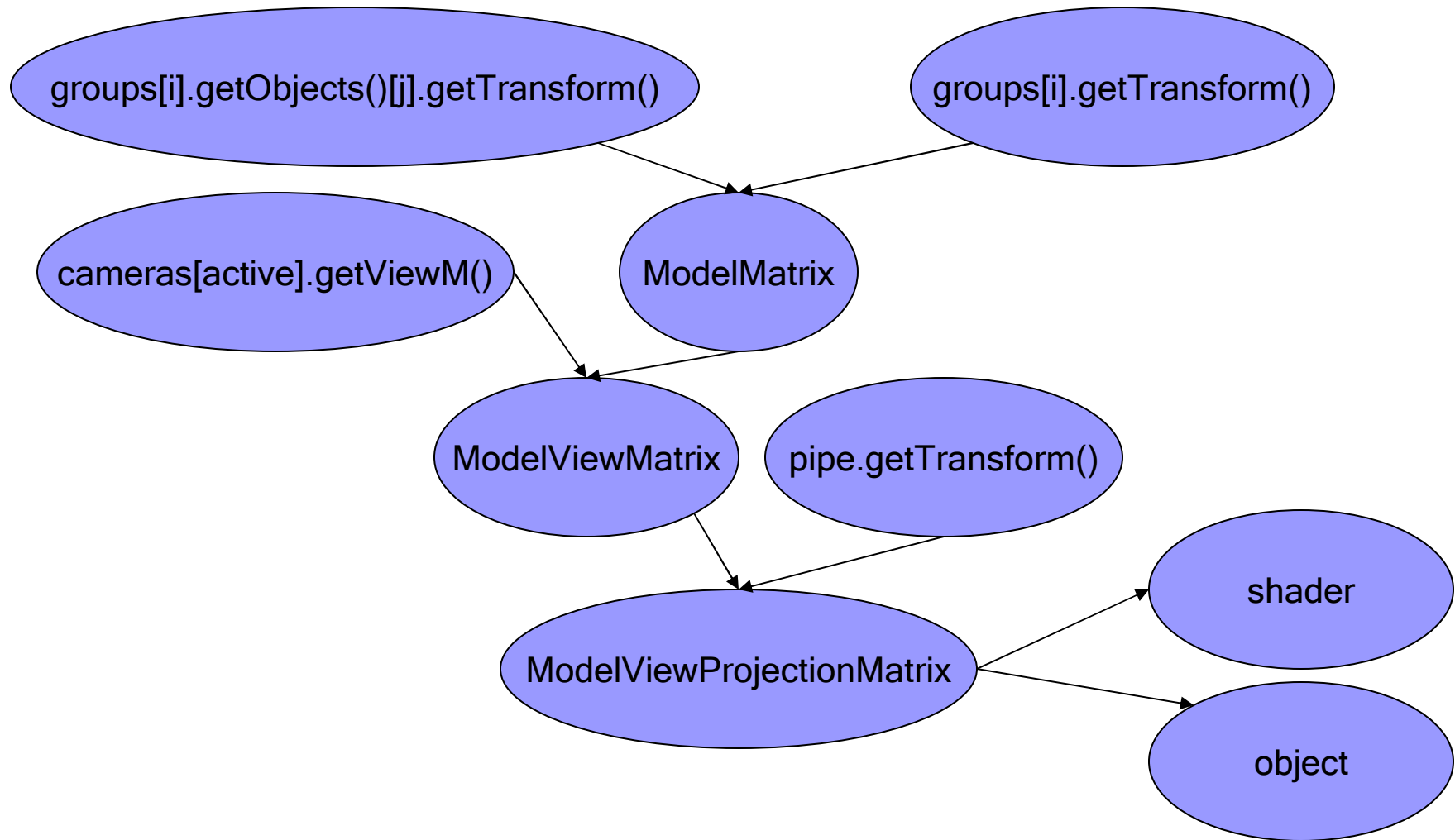


# Scene configuration file

- S Scene
- G Group1 0 0 0 0 0 1 0 0 1 1 1
- O Object1 test/ static 0 0 0 0 1 0 0 1 1 1
- C Camera1 0 100 100 0 0 0 64
- L Light1 O 0 1000 1000 0 0 0 1 1 1 1 0
- L Light2 P 0 100 1000 1 1 1 1 0
- --- More options later ---



# Pipeline





# Drawing sequence

- Main Loop
  - 3D initialization, settings
  - 3D draw to frame buffer
  - 2D initialization, settings
  - Postprocess
  - 2D text, menu
  - Final draw to screen



# Drawing sequence

- Draw to buffer function
  - for each material
    - `glUseProgram(material.getProgram())`
    - Set up attrib pointers
    - Set up textures, color uniforms
  - for each group
    - for each object
      - If pipeline changed, recalculate MV, MVP
      - `glDrawElements - triangles, indices.size()`



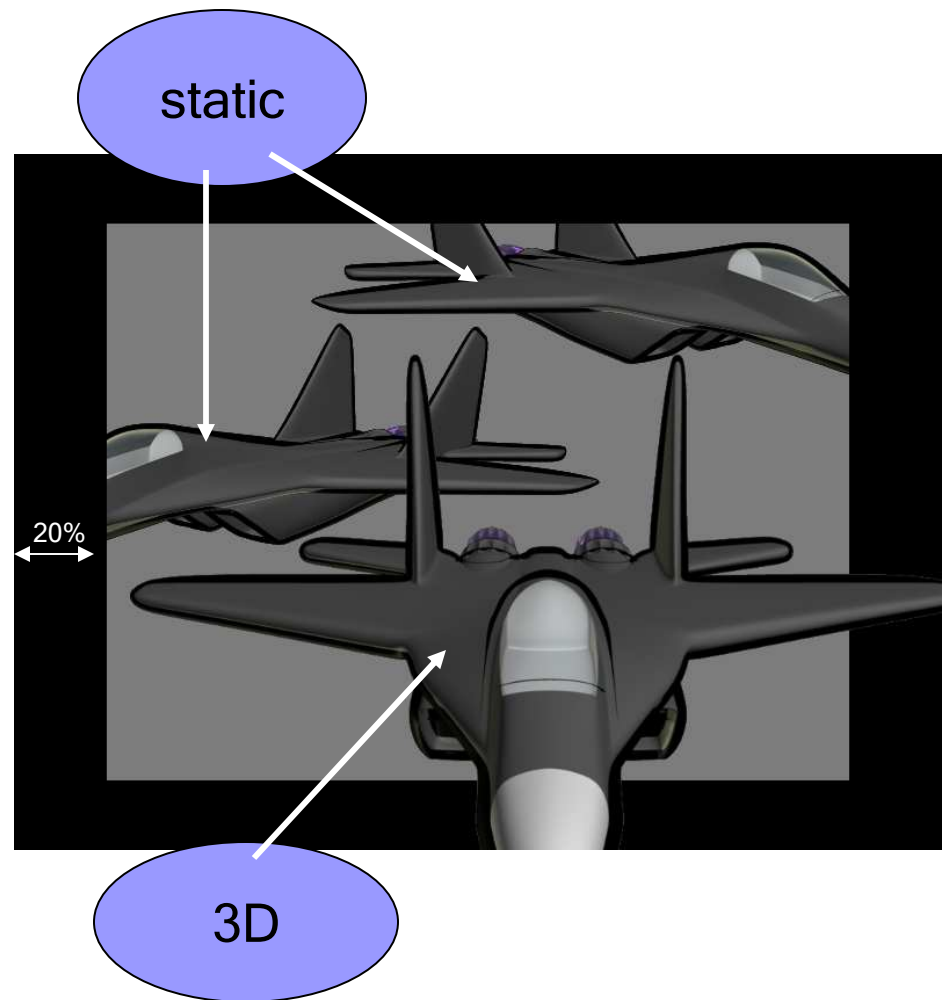


# Drawing sequence

- `struct buff {  
 string material;  
 vector<unsigned int> indices;  
 unsigned int bufferID;  
} buff;`
- `int useBuffer = objects.getIndices(material.getName());`
- `Bind objects.getBuffers()[useBuffer].bufferID;`
- Materials can be ordered by transparency

# “3D” effect

- Neutral colored frame
- Static or 3D objects
- In fragment shader:  
if static  
if projected position is in  
frame area  
discard;
- Static: terrain, environment
- 3D: moving, dynamic objects





# To Do

- Graphical enhancements
- Lighting/shadow system
- Dynamic sky
- Special materials
- Menu
- Animations
- Ultimately an editor
- Game functionalities



# Why would you use it?

- No programming skill needed to use it
- Quick presentation
- Portable
- Memory efficient



# Questions and Answers



Thank you!