

## CV Appendix

### - Rendering

- Rendering abstraction (OpenGL [\[code\]](#), Vulkan, DirectX 12)
- Window abstraction (Win32)
- WebGL
- WebGPU (web/Dawn)
- Rasterization
  - Forward, Deferred, [Visibility](#)
  - [Deferred materials](#)
  - PBR
  - Normal/shadow/displacement mapping
  - Transparency
- Ray-tracing [\[code\]](#)
  - Monte-Carlo
  - Smooth, rough and emissive surfaces
  - Reflection, refraction
- Ray marching
- Compute
  - Prefix sum
- Synchronization
- Tonemapping
- Atmosphere scattering

### - IO

- Filesystem abstraction
- Byte & bit streams
- DEFLATE decompression
- FBX [\[code\]](#), OBJ/MTL, PNG, QOI and TTF decoding
- QOI encoding
- Asset library
- Custom image and font formats

### - 2D Physics

- [Rigid bodies](#)
- [GJK \[code\]](#)
- [SAT](#)
- Friction
- Euler, Semi-Implicit Euler, Velocity-Verlet
- Warm Starting
- [Sequential Impulses](#)
- [Continuous collision detection \(Conservative Advancement\)](#)

### - 3D Physics

- [Rigid bodies](#)

- [GJK/EPA \[code\]](#)
- [MPR](#)
- Friction
- Sutherland-Hodgman
- **Mathematics**
  - Library ([specification](#))
  - Vectors, matrices, quaternions
  - Trigonometry
  - Barycentric coordinates
  - Intel intrinsics (SSE, AVX)
- **Language Support**
  - Lexical analysis
  - Syntactic analysis
  - Semantic analysis
  - Code generation
  - AST debugging
  - LSP server
- **UI**
  - Immediate/retained
  - Components (text, quads)
  - Layout calculation
  - Event handling
  - Styles & customization
- **Typography**
  - UTF-8 decoding
  - Bitmap fonts
  - True-Type fonts
  - High-resolution text with [signed distance fields](#)
- **Tools**
  - Asset builder [\[code\]](#)
  - Logger
  - Profiler
- **Anti-Aliasing**
  - MSAA
  - FXAA
- **Other**
  - Sparse ECS
  - Dynamic Vulkan memory allocator
  - Emscripten
  - Git