

# Hyunwoo Yang

[hyunwoo.yang@digipen.edu](mailto:hyunwoo.yang@digipen.edu) • [www.linkedin.com/in/hyunw00](http://www.linkedin.com/in/hyunw00) • [yanghyunw00.github.io/portfolio](http://yanghyunw00.github.io/portfolio) • 425-436-0362

## EDUCATION

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**DigiPen Institute of Technology | Redmond, Washington**

**May/2028**

**B.S. in Computer Science , Real-Time Interactive Simulation| GPA: 3.91**

**Relevant Courses:** Computer Graphics, Operating Systems, Data Structures and Algorithms, Databases, Network Programming

## TECHNICAL SKILLS

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**Programming Languages:** C/C++, C#, JavaScript, GLSL, Assembly, MySQL, HTML / CSS

**Engines:** Custom Engine, Unity, Unreal, Godot

**Tools:** OpenGL, Vulkan, Linux, RenderDoc, Perforce, Git, Github

**Other Skills:** Multithreading(job system), Object-Oriented Programming

## PROJECTS

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**Graphics Calculator | [yanghyunw00.github.io/project/calc](http://yanghyunw00.github.io/project/calc)**

**Jun/2026 - Sep/2026**

- Full-stack bilingual (ko/en) math web app built with React 19, Vite, Three.js and Math.js, offering 18 solvers across matrix, calculus, vector and 3D graphics, each returning step-by-step derivations rendered as LaTeX through KaTeX.
- Cut initial JS payload 83% (504 KB to 85 KB gzip) with React.lazy route-level code splitting, deferring Three.js, mathjs and KaTeX to the routes that need them. Deployed as a static build on GitHub Pages.
- Built the computation layer on Math.js and Nerdamer covering determinants, inverses, LU/SVD decomposition, eigenvalues, derivatives, integrals, limits and Taylor series, emitting structured solution steps rather than a bare answer.
- Implemented real-time Three.js visualization: MVP matrix transforms with three light types and shadow mapping (Basic/PCF/PCF Soft), vector cross products and parametric surface meshes for partial derivatives.

**Lost Guns | Solo Developer | [DOWNLOAD](#)**

**Jan/2026 -Mar/2026**

- Recreated the core mechanics of the mobile game LostGuns as a 2D multiplayer shooter in Unity, built from scratch by studying gameplay footage.
- Reverse-engineered four core systems — movement, jumping, ladder traversal and weapon switching and added friend-to-friend online play for up to 8 players via Unity Relay.
- Integrated 2D assets by rigging them with DragonBones and manually authoring skeletal animations to faithfully replicate the original game's visual dynamics.
- Implemented server-authoritative hit detection with lag compensation, rewinding player positions to account for RTT and interpolation delay, clamped to a 0.4s maximum.

**I.G.Y | TECH LEAD | [IGY\\_presskit](#)**

**Jan/2026 - Mar/2026**

- Designed and implemented A\* pathfinding with spatial partitioning to navigate up to 500 citizen agents in real time and applied backtracking to solve constraint-based placement problems in the city simulation.
- Profiled the pathfinder and found 91% of node-reset work was wasted (1.93M nodes cleared to expand 160K).
- Rewrote it with generation-stamped lazy initialization and stack-allocated neighbor buffers, cutting per-node cost  $1.6\mu\text{s} \rightarrow 0.84\mu\text{s}$  and a measured 179ms frame spike to a projected 111ms.
- Replaced the immediate-mode renderer with a GPU-instanced batch renderer, cutting draw calls  $9,256 \rightarrow 11$  and frame time  $58.6 \rightarrow 38.3\text{ms}$  ( $17 \rightarrow 26$  FPS), by packing per-quad transform, UV and tint data into a 96-byte instance record batched across 64 texture slots.
- Expanded a Computer Graphics coursework renderer into a standalone engine, Dokev, abstracting raw OpenGL into single-function calls so teammates new to graphics could focus on gameplay and AI.
- Led technical architecture and version control workflow for a 5-person team, translating gameplay design goals into an engine roadmap built on custom C++/OpenGL.

## LEADERSHIP EXPERIENCE

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**Military Service | Squad Leader (Sgt.) | Daegu, South Korea**

**Aug/2025 - Feb/2025**

- Led and trained an 8-person mortar squad, coordinating operations and communicating clearly under pressure to align the team and make time-sensitive decisions together.

## AWARDS

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- **Departmental Valedictorian** — awarded full-tuition merit scholarship
- **Korea-U.S. Advanced Technology Scholar** — selected for a national program supporting promising science and engineering students, receiving up to \$18,000 in funding