

Yonghyun Gwon

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EDUCATION

Kyung Hee University — Seoul & Yongin, South Korea

Expected Feb 2027

B.Eng. in Software Convergence | GPA: 4.33 / 4.5 | Full Tuition Scholarship — 8 semesters

PUBLICATIONS

Conference Papers

- KunHo Heo, SuYeon Kim, **Yonghyun Gwon**, Youngbin Kim, MyeongAh Cho.
"ParTY: Part-Guidance for Expressive Text-to-Motion Synthesis."
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2026.
- Yonghyun Gwon**, KunHo Heo, YoungKwan Cho, SuYeon Kim, HaYoung Lee, MyeongAh Cho.
"Word-Motion Cross Attention for Fine-Grained Text Guided Human-Human Interaction Motion Generation."
Korea Software Congress (KSC), 2025.

Posters & Research Demonstrations

- Jaehyun Byun, Byunghoon Kang, **Yonghyun Gwon**, Hongsong Choi, Yunseo Do, Eunho Kim, Sangkeun Park, Seungjae Oh.
"CrossGaussian: Enhancing Remote Collaboration through 3D Gaussian Splatting and Real-Time 360° Streaming."
ACM UIST 2025 Adjunct; IEEE ISMAR 2025 Adjunct.

RESEARCH EXPERIENCE

Visual Science Lab (VSLab), Kyung Hee University

Jul 2025 - Feb 2026

Undergraduate Research Assistant | Advisor: Prof. MyeongAh Cho

- Proposed Word-Motion Cross Attention (WMCA) for text-driven human-human interaction motion generation, improving InterHuman text-motion retrieval by +2.3 / +3.4 / +3.2 points on R-Precision Top-1/2/3 while maintaining MM-Dist.
- Extended the WMCA study into a completed undergraduate thesis evaluating sequence-level, time-indexed, and event/state interaction representations through conditioning, candidate-selection, and residual-actionability analyses. The results motivated representations that explicitly encode interaction timing, involved body parts, participant roles, and event order.
- Contributed to ParTY's qualitative evaluation through matched-prompt and matched-seed comparisons across HumanML3D, MoMask, ParCO, and ParTY, assessing part-level prompt adherence and failure cases; transformed the initial renders into publication-ready, part-aware figures through substantially improved framing, body-part distinction, and rendering quality.

Interactive Technology & Methodology Lab (HCI Lab), Kyung Hee University

Sep 2024 - Dec 2024

Research Contributor | Advisor: Prof. Seungjae Oh

- Led the initial Cross-Reality and Reality-Virtuality Continuum literature survey and translated early research exploration into experimental scenarios for 3DGS-based remote collaboration, contributing to CrossGaussian.
- Prototyped the 360° capture-to-3DGS and Unity collaborative-viewing workflow, testing both networked view synchronization and direct TCP/UDP data sharing across two machines.

SkinHaptics Project | HCI Lab, Kyung Hee University

Apr 2024 - Jul 2024

Research Contributor | PI: Prof. Seungjae Oh

- Built the Unity VR experiment environment used in the CHI 2025 study, implementing Euler-based vertex deformation, distance-based attenuation, and Oculus hand-skeleton gesture triggers for skin-softness perception experiments.

WORK EXPERIENCE

FunctionBay / MetaMotion X — Simulation / Digital Twin Developer

Jul 2024 - Aug 2025

Pangyo Techno Valley, South Korea

- Developed and integrated replay and event-logging features within a large existing Unity codebase for a defense-linked simulation, resolving file I/O failures, incomplete writes, and multi-PC log-collection issues.
- Designed and implemented network-synchronized multi-client simulation systems, maintaining consistent runtime behavior by debugging state transitions and client desynchronization during integration.
- Authored technical specifications and architecture documentation for production features, translating implementation details into clear requirements and supporting unit and integration testing, bug reproduction, and fix verification.

M5ers - Backend Intern

Nov 2024 - Jan 2025

Remote & San Jose, CA, USA

- Built a Node.js/Express backend and C UART control process for an FPGA-based mining-hardware prototype, connecting register read/write APIs to low-level command routing, response formatting, and integration testing.

Republic of Korea Army - UNIX Server Operator

May 2021 - Nov 2022

The 1st Logistic Support Command, South Korea

- Operated UNIX servers for a military C4I intranet, supporting security checks, log audits, backups, access control, network troubleshooting, and Log4j incident-response procedures under command guidance.

PROJECTS

GenMotion2Physics

May 2026 - Present

Tools: Python, MuJoCo, PyTorch

- Built a MuJoCo retargeting pipeline that maps reference and generated human motion to an articulated SMPLSim humanoid using coordinate/root correction and damped Jacobian IK, achieving approximately 1.7 cm mean joint-position error.
- Developed free-root StablePD/PPO motion tracking under gravity and contact, then tested specialist policies, distillation, and rehearsal for acquiring new motions while retaining existing tracking capability.
- Compared ground-truth and generated motions using the same humanoid and controller. Ground truth passed 3/3 versus 8/30 generated motions; some failures were already visible in the source or retargeted motion, while others emerged only during physics tracking.

Open-Source Contributions

- Microsoft/ONNX Runtime (Merged, PR#29879): Fixed a CUDA tensor-reduction bug that interpreted values by byte size rather than actual numeric type, causing silently incorrect arithmetic results, and added broad regression coverage.
- NVIDIA/CUTLASS (Merged, PR#3394): Fixed an FP8 matrix-multiplication indexing error that could select incorrect scaling values when GPU thread blocks were reordered, producing incorrect outputs or invalid memory access under specific layouts.
- NVIDIA/CCCL (Merged, PR#9861): Fixed a compatibility defect that prevented a CUB (CUDA primitives library) parallel algorithm from working with CUDA container iterators and added cross-compiler regression coverage.

AI-Based Multiplayer Latency Predictor

Nov 2024 - Dec 2024

Tools: C++, Python, Unreal Engine 5, PyTorch, ONNX/NNE

- Led a UE5 latency-compensation project by reframing nonlinear vehicle prediction as motion-delta regression and training a PyTorch Residual+GLU network on custom vehicle-motion features.
- Integrated the ONNX model through Unreal Engine 5 NNE for asynchronous 10 Hz inference inside a custom movement component, improving drift-trajectory tracking over constant-velocity prediction.

TEACHING & MENTORING

Course Mentor — AI and Game Programming

Mar 2026 – Jun 2026

- Designed and developed the base Unity ML-Agents framework used by all students in the course as the starting point for their reinforcement-learning term projects, and mentored teams during implementation.

Game Development Club – Study Leader & Mentor

2023, 2024

- Led Unreal Engine C++ and Unity study sessions, mentoring student developers in multiplayer programming, gameplay systems, and engine workflows.

HONORS & ACTIVITIES

1 st Place — UNIJAM Game Jam (Smilegate & UNIDEV)	2024
2 nd Place — Immersive Tourism Content Contest (Korea Tourism Organization)	2024
2 nd Place — University Portfolio Competition (Kyung Hee University)	2024
Additional University Awards — 2 nd place, 3 rd place, and Creativity Award in Software and Artistic-Software Competitions	2024
Exhibitor — G-STAR Game Exhibition (Korea Association of Game Industry)	2023, 2024
Selected Participant — NexonJam Competition (28 programmers selected nationwide)	2024

TECHNICAL SKILLS

Advanced: C/C++, C#, Unity, Unreal Engine
Proficient: Python, PyTorch, ONNX/NNE, Node.js/Express
Familiar: OpenCV, JavaScript, HTML/CSS
Tools: Git, Perforce (P4V), Jira, Azure DevOps, Redmine
Languages: English (TOEFL iBT 5.0/6.0), Korean (native), Japanese (conversational)