GONG, Xianjin

PhD candidate in Computer Graphics & Character Animation, École Polytechnique (LIX)

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EDUCATION

École Polytechnique (LIX) — **PhD in Computer Graphics** — 2024.10 – 2027.9 (expected) — France
- Topic: editing 3D keyframed animation via gesture & vocal inputs; supervisors: Damien Rohmer, Vicky Kalogeiton

Institut Polytechnique de Paris — **MSc Interaction, Graphics & Design** — 2022.9 – 2024.10 — France
- GPA: 4.0 / 4.0

Hong Kong Univ. of Science & Technology — **BSc Physics & CS (dual)** — 2017.9 – 2021.12 — Hong Kong
- CGA: 3.65 / 4.3; research on quantum computing simulation (VQE / QDrift, Python, IBMQ), 2021.7 – 2022.8

SKILLS

- **Game engine**: Unity (3 years) — compute shader (HLSL) acceleration, C++ native plugin integration, interactive editor tooling
- **Graphics & rendering**: OpenGL, WebGL / three.js (custom GLSL stylized-rendering shaders)
- **DCC**: Blender (procedural modeling with Geometry Nodes)
- **Programming**: C++, C#, Python, JavaScript (HTML / CSS)
- **AI / ML**: PyTorch (diffusion / DiT motion models), SMPL body model
- **Languages**: Chinese (native), English (fluent, TOEFL 105), Japanese (conversational), French (basic)

RESEARCH & PROJECT EXPERIENCE

Herds from Video — **First author / CGF 2025** — 2024.4 – 2024.9 — Unity / C++
- Real-time simulation: 1000-agent herd in Unity (20–30 FPS), ray-casting animal vision accelerated by compute shaders (HLSL)
- Parameter learning: differentiable SGD optimizer in C++, compiled as a Unity native plugin, learning herd behaviour from drone footage
- Authoring tools: interactive UI for drawing leader routes, plus behaviour brushes and region painting; behaviours generalize across terrains and herd sizes

Vocal-driven motion editing — **PhD project / first author** — 2024.10 – present — PyTorch / three.js
- AIGC motion editing: diffusion (DiT) + SMPL model where vocal sounds control the timing, intensity and phrasing of a motion, with per-body-part control and spatial composition; preferred over SOTA baselines in all four tasks of a 27-participant user study
- Animator tooling: full-pipeline web tool built from scratch (three.js, custom GLSL stylized rendering) covering data processing, inference and visualization, for animators at partner studio Dada! Animation

Halvorsen Lace — **Personal work / JFIG 2025** — 2025.10 — Blender Geometry Nodes
- Procedural modeling: parametric tulle thread structure, (u, v)-parametric rosette patterns, Poisson-disk instancing, global bending along a Halvorsen attractor

PUBLICATIONS

Herds from Video: Learning a Microscopic Herd Model from Macroscopic Motion Data
- **Xianjin Gong**, James Gain, Damien Rohmer, Sixtine Lyonnet, Julien Pettré, Marie-Paule Cani
- *Computer Graphics Forum (CGF)*, Vol. 44, 2025
- https://ip-paris.hal.science/hal-05243580/

Collision Free Simplification for 2D Multi-Layered Shapes
- **Xianjin Gong**, Amal Dev Parakkat, Damien Rohmer
- *IMET 2023*
- https://hal.archives-ouvertes.fr/hal-04215443

Optimizing Multi-Agent Herd Model from a Single Video
- **Xianjin Gong**, James Gain, Damien Rohmer, Julien Pettré, Marie-Paule Cani
- *JFIG 2024*, **Best Paper Honorable Mention**

Simple Shape Animation Editing with Onomatopoeic Sound
- **Xianjin Gong**, Damien Rohmer, Vicky Kalogeiton
- *JFIG 2025* (communication)

TEACHING

- **Unity course design & teaching**: *Creative and Generative Models in Computer Graphics* (Prof. Marie-Paule Cani) — guiding students to build agents interacting with a virtual world, optimized with AI
- **Other TA courses** (2024 – 2026): Computer Animation, Advanced Deep Learning, Computer Graphics, Python Data Analysis, Web Programming