Ikhan Choi

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PROJECTS

GAME ENGINE

⌨ github.com/ikhanchoi/game-engine

➜ レンダリングとシミュレーションで遊べる実験室をパソコンに作りたいという目標を目指して、趣味として開発している ECS 基盤自作ゲームエンジンです。OpenGL と tinyGLTF を使います。現在イベントシステム、カスタムアロケーター、レンダラーなどが実装されています。

RENDERING

⌨ github.com/ikhanchoi/blackhole

➜ インターステラーのブラックホールを描画するために頑張っています。モノマネではなく、現論文に従ってアインシュタイン方程式をフラグメントシェーダーで解こうとしています。マルチスレッドで gif ファイルを録画する機能も作りました。

PHYSICS SIMULATIONS

⌨ github.com/ikhanchoi/pba-ikhanchoi

➜ 梅谷信行先生の 2025 年 S セメスターの授業「物理基盤アニメーション」の課題レポジトリーです。Rust と Unity で簡単なシミュレーションを行う課題で、成績は優でした。

SKILLS AND QUALIFICATIONS

Natural Language: Korean (native), Japanese (fluent), English (proficient)

Programming Language: C++, Python, LaTeX

EDUCATION

The University of Tokyo   Apr 2025 – Now
  Ph.D. program in Mathematical Science

The University of Tokyo   Apr 2023 – Mar 2025
  M.S. in Mathematical Science

Pohang University of Science and Technology   Mar 2016 – Aug 2022
  B.S. in Mathematics
  (Early graduation: leave of absence for three years including military service)

Seoul Science High School   Mar 2013 – Feb 2016
  (Specialized high school for gifted students)

WORKING EXPERIENCES

R&D on Natural Language Processing for Chatbot development   Jun 2019 – Aug 2019
  Internship Program, Persona AI Co., Ltd.

  ➜ Implemented variable length HMM, Bahdanau attention model, and sentiment analyzer with seq2seq.

ACADEMIC EXPERIENCES

INTERESTS

Functional Analysis and Homotopy Theory

PUBLICATIONS

I. Choi, *A solution to Haagerup's problem and positionve Hahn-Banach separation theorems in operator algebras*,
to appear in Journal of Functional Analysis, arXiv: 2501.16832. (Master's thesis)

➜ Solved a 50-year-old open problem posed by U. Haagerup, who had finished the classification of amenable type III von Neumann algebras and was one of founders of Tomita-Takesaki theory.

I. Choi, *Curved folding and planar cutting of simple closed curve on a conical origami*,
Kodai Math. J., 39-3 (2016) 579-595. (High school thesis)

➜ Suggested a problem in terms of classical differential geometry of determining whether a closed curve on a plane can be realized as the intersection of a piecewise smooth isometric immersion of the plane and another plane embedded in the three-dimensional Euclidean space.

AWARDS AND HONORS

Research Fellowship for Young Scientists (学振 DC2)   Apr 2026 – Mar 2028
Japan Society for the Promotion of Science (JSPS)

Dean's Award (研究科長賞)   Mar 2025
M.S. in Graduate School of Mathematical Science at the University of Tokyo

Japanese Government (MEXT) Scholarship (国費留学生)   Apr 2023 – Mar 2026
Embassy recommendation

Gold Prize in 38th Mathematics Competition for University Students in Korea   Nov 2019
1st group for math majors
Sponsored by Korean Mathematics Society

TEACHING

Teaching Assistant: Linear Algebra II   Fall 2025

Teaching Assistant: Geometry II   Fall 2024

Teaching Assistant: Complex Analysis I   Fall 2023

Student Mentoring: Introduction to Differential Geometry   Fall 2019

OTHER EXPERIENCES

Military Service   Jan 2020 – Jul 2021
1st Marine Division Band, Republic of Korea Marine Corps
Military Musician (Saxophone)