Ikhan Choi

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Education

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

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

Research Interests

Functional analytic features of bivariant K-theories and noncommutative topology from the viewpoint of homotopy theory, and their applications to representation theory and mathematical physics.

Publications

I. Choi, *A solution to Haagerup's problem and positionve Hahn-Banach separation theorems in operator algebras*, preprint, arXiv: 2501.16832. (Master's thesis)
Solved a 50 years old open problem posed by U. Haagerup.

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 $\mathbb{R}^3$.

Academic Experiences

Senior thesis, POSTECH Spring 2022
Title: *Three perspectives on Bochner's theorem: from Herglotz representation to Pontryagin duality*
Advisor: *Younghwan Son*
Investigated Bochner's theorem from three different viewpoints; complex analysis, probability theory, and representation theory using GNS construction. As an application, proved the Pontryagin duality theorem.

Undergraduate Research Program, POSTECH Fall 2019
Title: *Global Existence of the Vlasov-Poisson System*
Advisor: *Donghyun Lee*
Proved the local existence of the Vlasov-Poisson system and reviewed Schaeffer's paper on the global existence.

IBS-CGP Mathematics Festival (Research Experience Program), POSTECH Aug 2018
Topic: *Variations on a Theme: On the Dispersion of Waves*
Advisor: *Sung-Jin Oh*

Teaching Experiences

Teaching Assistant: Geometry II Fall 2024

Teaching Assistant: Complex Analysis I Fall 2023

Student Mentoring: MATH 423 Introduction to Differential Geometry Fall 2019

Awards and Honors

Dean's Award — Mar 2025
M.S. in Graduate School of Mathematical Science at the University of Tokyo

Japanese Government (MEXT) Scholarship — Apr 2023 – Now
Embassy recommendation, Research student

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

Talks

POSTECH – KAIST – UNIST Undergraduate Math Club Joint Seminar — Aug 2019
Title: *Diachrony of Spectra*
Focusing on the word "spectrum", followed the history of how mathematical languages are created in the interdisciplinary study of physics, analysis, and geometry.

POSTECH Undergraduate Mathematics Seminar — Nov 2018
Title: *Dispersion for the Schrödinger Equation*
Proved the dispersive inequality for the Schrödinger equation, using the theory of Fourier transforms and oscillatory integrals.

Work Experience

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

Summer Experience Society (Internship Program) — Jun 2019 – Aug 2019
Persona AI Co., Ltd.
R&D on Natural Language Processing (Chatbot development)
Implemented probabilistic graphical models, attention model, and sentiment analyzer.

Other Skills and Qualifications

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