YOUNGHUN JO

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RESEARCH INTERESTS

Probability Theory, Arithmetic Dynamics

EDUCATION

Seoul National University Mar 2019 – Present
Bachelor of Science in Mathematics
Leave for Mandatory Military Service, Mar 2021 – Sep 2022

Seoul Science High School Mar 2016 – Feb 2019

PUBLICATIONS

[1] **The Eyring–Kramers Law for Extinction Time of Contact Process on Stars.** arXiv:2405.09501 (2024)
Submitted.

RESEARCH EXPERIENCE

Metastability of Contact Processes Sep 2022 – Present
Undergraduate Independent Research, Advisor: Professor Insuk Seo

- Investigated potential theoretic approach to metastability and its application to various stochastic models.
- Reviewed previous results on metastable behavior of the contact process on finite graphs and random graph models based on coupling and comparison with oriented percolation.
- Examined sharp asymptotic behavior of the energy landscape of the contact process on star graphs, and established the Eyring–Kramers law for the mean extinction time of the process.

Arithmetic Dynamics of Polynomial Maps Aug 2023 – Present
Undergraduate Research Internship, Advisor: Professor Junho Peter Whang

- Studied arithmetic dynamics of rational maps. Inquired Milnor's parametrization of the moduli space of quadratic rational maps. Also probed Silverman's approach on the equality of the field of definition and the field of moduli, addressing the cohomology structure of rational maps and the theory of algebraic curves.
- Examining sharp uniform bound for the periodic orbit size of polynomial maps on integral affine spaces. Established the local–global principle for the periodic orbit type.

Extreme Value Theorem and Geodesic Coding for Generalized Continued Fractions Dec 2020 – Sep 2022
Undergraduate Research Internship, Advisor: Professor Seonhee Lim

- Studied ergodic theory of the geodesic flow on modular surfaces and its connection to the continued fraction via geodesic coding. Investigated various generalizations of the dynamics on the hyperbolic surface.
- Surveyed mixing property and extreme value theorem of generalized continued fractions. Inquired Pollicott's extreme value theorem on $\mathbb{H}/\operatorname{SL}_2\mathbb{Z}$ derived from Galambos's extreme value theorem of continued fractions.

HONORS & AWARDS

1st Place, Undergraduate Independent Research, Seoul National University Fall 2023
Metastability of Contact Processes

1st Place, Simon Marais Mathematics Competition*, Individuals Division 2022
2nd Place in 2023
*Asia-Pacific Joint Undergraduate Mathematics Competition

The National Scholarship for Science and Engineering, Korea Student Aid Foundation Spring 2019 – Present
Leave for Mandatory Military Service, Spring 2021 – Fall 2022

Dean's List, College of Natural Sciences, Seoul National University 2019, 2020, 2023

Gold Medal, University Students' Contest of Mathematics, Korean Mathematical Society 2019, 2020, 2021, 2023

Silver Medal, Korean Mathematical Olympiad 2016, 2017

Selected Talks*

The Eyring–Kramers Law for Extinction Time of Contact Process on Stars (abstract) (slides) — Jun 2024
Invited Talk at KIAS Analysis, PDE & Probability Seminar

Metastability of Contact Processes (notes) — Jun 2024
SNU Probability Group Reading Seminar

Cohomology Structure of Fixed Point Sets (slides) — Jun 2024
SNU Graduate Course: *Algebraic Topology II*

Two Dimensional Random-Cluster Model (notes) — Aug 2023
Graduate Percolation & Random-Cluster Model Reading Seminar

Free Energy of Percolation and its Differentiability (notes) — Jun 2023
Graduate Percolation & Random-Cluster Model Reading Seminar

*A full list of the talks and materials can be found here: starrysky422.github.io/talks

Teaching Experience

Teaching Assistant, *Calculus Practice I* — Spring 2024
Seoul National University

Lecturer, *Introduction to Category Theory* (notes) — Winter 2023
Winter Mentoring in College of Natural Sciences, Seoul National University

Lecturer, *Introduction to Mathematical Analysis (with practice) I* (notes) — Winter 2022
Major Tutoring School in College of Natural Sciences, Seoul National University

Teaching Assistant, Korean Mathematical Olympiad Training Camp — Summer 2019, Winter 2020

Attended Conferences & Workshops

(Scheduled) **13th Cornell Probability Summer School,** Cornell University — Jul 2024 – Aug 2024

Workshop on Combinatorics and Probability, KIAS — Jun 2024

2024 Algebra Camp, QSMS — Feb 2024

Probability Workshop in Korea 2024, SAARC — Jan 2024

Probability Winter School in Korea 2023, KIAS — Dec 2023

KMS Special Conference with 2022 Fields Medalists — Oct 2023

The 3rd International Undergraduate Mathematics Summer School, Seoul National University — Aug 2023

Random Structures & Algorithms 2023, Carnegie Mellon University — Jun 2023

Seminars & Reading Courses

SNU Probability Group Reading Seminar — Sep 2023 – Present

Weekly Peer Mathematics Seminar — Oct 2023 – Present

Graduate Exchange Seminar — Aug 2023 – Present
Supervisor: Professor Gyeseon Lee

Graduate Seminar on Diophantine Analysis — Aug 2023 – Nov 2023
Supervisor: Professor Junho Peter Whang

Graduate Percolation & Random-Cluster Model Reading Seminar — May 2023 – Aug 2023
Supervisor: Professor Insuk Seo

Algebraic Topology Reading Seminar — Jun 2020 – Aug 2020

Fun with Mathematics: Student-Directed Seminar — Mar 2020 – Jun 2020