JAEHYUN WOO

wjhwsh1@snu.ac.kr
1, Gwanak-ro, Gwanak-gu, Seoul, Republic of Korea
https://jaehwoo.github.io

EDUCATION

Seoul National University *Mar 2025 - Current*
Ph.D. Student in Mathematics

Seoul National University *Mar 2019 - Feb 2025*
B.S. in Mathematics (minor in chemistry); *summa cum laude* GPA: 4.16/4.3
Thesis: Restriction Estimates for Hypersurfaces (Advisor: Changkeun Oh)
Leave for Mandatory Military Service: Sep 2022 - Aug 2024

RESEARCH INTERESTS

My research interest is in harmonic analysis and related fields. I'm currently interested in applying methods from geometric measure theory to problems in harmonic analysis.

RESEARCH EXPERIENCE

Undergraduate Research Internship, Seoul National University *Sep 2024 - Jan 2025*
Topic: "Multilinear Estimates, Broad-narrow Analysis, and Induction on Scales" (Advisor: Changkeun Oh)
· Studied the evolution of restriction theory: bush and hairbrush argument for Kakeya type estimates, multilinear estimates, polynomial partitioning method, broad-narrow analysis and induction on scales.
· Studied the evolution of decoupling theory and its application to Vinogradov's mean value theorem in analytic number theory.
· Done in tandem with undergraduate thesis.
· Keywords: restriction inequalities, decoupling inequalities, multilinear estimates, broad-narrow analysis, induction on scales

Undergraduate Research Internship, Seoul National University *Jun 2022 - Aug 2022*
Topic: "Small Scale Formation of 2D Incompressible Euler Equations on a Domain with Smooth Boundary" (Advisor: In-Jee Jeong)
· Showed vorticity gradient growth for a long time in a smooth domain similar to a disc or a strip, by applying the notion of Hausdorff convergence and gamma-convergence to the hyperbolic flow scenario near the boundary
· Keywords: 2D incompressible Euler equations, long-time behavior, Green's function for elliptic equations, boundary regularity, linear and nonlinear advection, Hausdorff convergence, γ-convergence, tubular neighborhood

Undergraduate Research Internship, Seoul National University *Dec 2021 - Feb 2022*
Topic: "Global-in-time Gevrey-1/s Regularity of Incompressible Euler Equations on 2D Torus" (Advisor: In-Jee Jeong)
· Studied new results on inviscid damping, and obtained Gevrey-1/s norm estimates with decreasing radius of analyticity by using paraproduct decomposition, which demonstrates global-in-time Gevrey-1/s regularity
· Keywords: 2D incompressible Euler equations, inviscid damping, long-time behavior, Fourier multiplier, paraproduct decomposition, Gevrey space, radius of analyticity

TEACHING EXPERIENCE

Teaching Assistant, Seoul National University *Mar 2025 - Current*
Calculus Practice 1 (2025 Spring)
· Conducted recitation sessions, graded exams and quizzes on convergence of series and power series (ongoing)

Undergraduate Tutor, Seoul National University *Mar 2022 - Jun 2022*
Basic Mathematics 1
· Conducted recitation sessions on basic single and multivariable calculus, ordinary differential equations and dynamical systems

SKILLS

Languages
· Korean(native), English(proficient)

Programming Languages
· Numerical Analysis: Python, Julia
· Computational Chemistry: GAMESS, ORCA (quantum computations), LAMMPS (classical molecular dynamics)