

# Curriculum Vitae

Hyojae Lim

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## Research Interest

1. Approximation theory on various function spaces using frames
2. Tight wavelet frame construction using the extension principles
3. Developing a proof-generating model together with interactive theorem provers
4. Abstract harmonic analysis – unitary representation theory on locally compact groups

## Education

Mar. 2017 - present      Ph.D. Candidate in Mathematics, Yonsei University, Korea  
Advisor : Prof. Youngmi Hur

Mar. 2012 - Feb. 2017    B.S. in Mathematics, Konkuk University, Korea

## Awards & Grants

- 2024      Travel Grant for partciting Trimester Program “Prospects of Formal Mathematics”  
            from Hausdorff Research Institute for Mathematics (HIM), Germany
- 2023      Travel Grant for partciting “Machine Assisted Proofs”  
            from Institute for Pure & Applied Mathematics (IPAM), USA
- 2021      Math & CSE Joint Poster Exhibition (1st Place)  
            from School of Mathematics and Computing, Yonsei University, Korea
- Dissertation Fellowship (DF)  
            from School of Mathematics and Computing, Yonsei University, Korea

## Publications

1. New Tight Wavelet Frame Constructions Sharing Responsibility  
Y. Hur and H. Lim  
Submitted
2. Simplifying Formal Proof-Generating Models with ChatGPT and Basic Searching Techniques (experience report)  
Submitted
3. Wavelet Series Expansion in Hardy Spaces with Approximate Duals  
Y. Hur and H. Lim  
Accepted to Analysis Mathematica

4. Understanding the Scattering Transform using Univariate Signals  
 Y. Hur and H. Lim  
 Proceedings of 11th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics (CISP-BMEI), 2018, pp. 1-7.

## Conferences & Talks

- 2023      Mathematical Image Processing Workshop, Yonsei University, Seoul, Korea  
**1st Konkuk University Mathematics Alumni Workshop**, Seoul, Korea  
*Wavelet Series Expansion in Hardy Spaces using Approximate Duals*  
**KMS Fall Meeting**, Seoul, Korea  
*On Construction of Tight Wavelet Filter Bank using the UEP and Beyond*  
**KMS Spring Meeting**, Daejeon, Korea  
*Wavelet Series Expansion in Hardy Spaces with Approximate Duals*  
 Machine Assisted Proofs, IPAM, Los Angeles, USA
- 2022      **KWMS Leaders Forum for Next Generation Women Mathematical Science Major**, Gwangju, Korea  
*Model Development of Formal Language Suitable for Mathematical Proof*
- 2021      KSIAM Fall Meeting, Busan, Korea  
**Yonsei Math & CSE Joint Poster Exhibition**, Seoul, Korea  
*Wavelet Series Expansion via a Wavelet System on Various Function Spaces*
- 2020      KSIAM Fall Meeting, Jeju, Korea  
**Yonsei Math & CSE Joint Poster Exhibition**, Seoul, Korea  
*New Bijectivity Result for  $H^p(\mathbb{R})$  via Wavelet Frames*  
 KMS Spring Meeting, Online
- 2019      KIAS Geometry Winter School, Gangwon, Korea  
 East Asian Conference in Harmonic Analysis and Applications, Seoul, Korea  
**KSIAM Spring Meeting**, Seoul, Korea  
*Understanding the Scattering Transform using Univariate Signals*
- 2018      **YPDE**, KIAS, Seoul, Korea  
*Understanding the Scattering Transform using Univariate Signals*  
**International Congress on Image and Signal Processing, BioMedical Engineering and Informatics (CISP-BMEI) 2018**, Beijing, China  
*Understanding the Scattering Transform using Univariate Signals*  
 Industrial Professional Academy, NIMS, Suwon, Korea  
 KWMS International Conference, Seoul, Korea  
 Future of Information and Communication Conference (FICC) 2018, Singapore  
 KMS Spring Meeting, Seoul, Korea  
 KIAS Geometry Winter School, Gangwon, Korea
- 2017      KIAS Geometry Winter School, Gangwon, Korea
- 2016      KIAS Geometry Winter School, Gangwon, Korea

## Teaching

### Teaching Assistant & Grading

Fall 2022 (Yonsei)	MAT3118-01	Partial Differential Equation (undergraduate)
	MAT8440-01	Topics in Partial Differential Equation (graduate)
Spring 2022 (Yonsei)	MAT3105-01	Analysis II (undergraduate)
	MAT6431-01	Topics in Fluid Mechanics II (graduate)
Fall 2021 (Yonsei)	MAT1012-01	Calculus II (undergraduate)
	MAT6430-01	Topics in Fluid Mechanics (graduate)
Summer 2021 (Yonsei)	MAT1012-01	Engineering Mathematics II (undergraduate)
Spring 2021 (Yonsei)	MAT1011-04,06	Engineering Mathematics I (undergraduate)
Fall 2020 (Yonsei)	MAT6450-01	Real Analysis II (graduate)
	MAT1002-05	Calculus & Vector Analysis II (undergraduate)
Summer 2020 (Yonsei)	MAT1012-04	Engineering Mathematics II (undergraduate)
Spring 2020 (Yonsei)	MAT6400-01	Real Analysis I (graduate)
Fall 2019 (Yonsei)	MAT3104-01,02	Analysis I (undergraduate)
Spring 2019 (Yonsei)	MAT2421-01	Ordinary Differential Equation (undergraduate)
	MAT2011-02	Linear Algebra and its Application (undergraduate)
Fall 2018 (Yonsei)	MAT3104-01	Analysis I (undergraduate)
Spring 2018 (Yonsei)		Calculus I (undergraduate)

### Computer Languages

Python, Lean, MATLAB