

The College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

Professor Grace Hyun Kim

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Wednesday April 2nd, 2025

60W Charlton Room 135

4:00-5:00pm

Enhancing Explainability in AI for Medical Imaging: Attention-Gated Learning for Robust Quantification of Pulmonary Fibrosis in CT

The explainability of artificial intelligence (AI) in medical imaging is crucial for ensuring its reliability and trustworthiness. Two main approaches support explainability: (1) information-driven analysis, which relies on physical measurements and error distribution assessments, and (2) objective-driven interpretation, which occurs in pre-configured environments with prior knowledge of error distributions. Recent advancements in deep learning (DL) highlight the importance of trustworthy AI, where traceability and explainability play key roles in patient-centered outcome research [Trustworthy AI Playbook, 2023].

One promising approach to enhancing explainability during AI model development is the integration of attention gates in pre-training layers [Vaswani, 2017; Yu, 2023]. Quantitative lung fibrosis (QLF) scores derived from AI and machine learning (ML) models are increasingly used to quantify pulmonary fibrosis patterns on high-resolution CT (HRCT) scans and assess therapeutic effects in clinical trials [Kim, 2021]. This talk will discuss past challenges in deep learning model development, lessons learned from previous failures, and the development of a novel algorithm for pulmonary fibrosis. Additionally, it will evaluate the model's robustness across varying CT imaging parameters.

**Refreshments will be served 3:15– 3:45 pm in the Faculty Lounge
4118 French Hall West**