ATS 2026 Highlights

Respiratory Structure and Function Early Career Professionals

Get to know members of the RSF Assembly

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Is your research clinical, basic science or translational?

Translational.

Tell us about your research?

My research focuses on developing advanced image-based and AI-driven methods to quantitatively analyze pulmonary structure and function from chest CT imaging. I work on airway and vessel segmentation, computational fluid dynamics, and structure-function relationships in chronic lung diseases such as asthma, COPD, and post-COVID conditions, with the goal of enabling robust and clinically meaningful biomarkers.

Where do you see yourself in 5 years?

In five years, I aim to develop digital-twin models for pulmonary disease diagnosis that integrate airway and vascular structure and function information.

What do you find is the major benefit of RSF Assembly Membership?

The RSF Assembly provides a unique opportunity to connect with engineers, imaging scientists, and clinicians, enabling meaningful discussions around respiratory structure and function relationships and fostering collaborative translational research.

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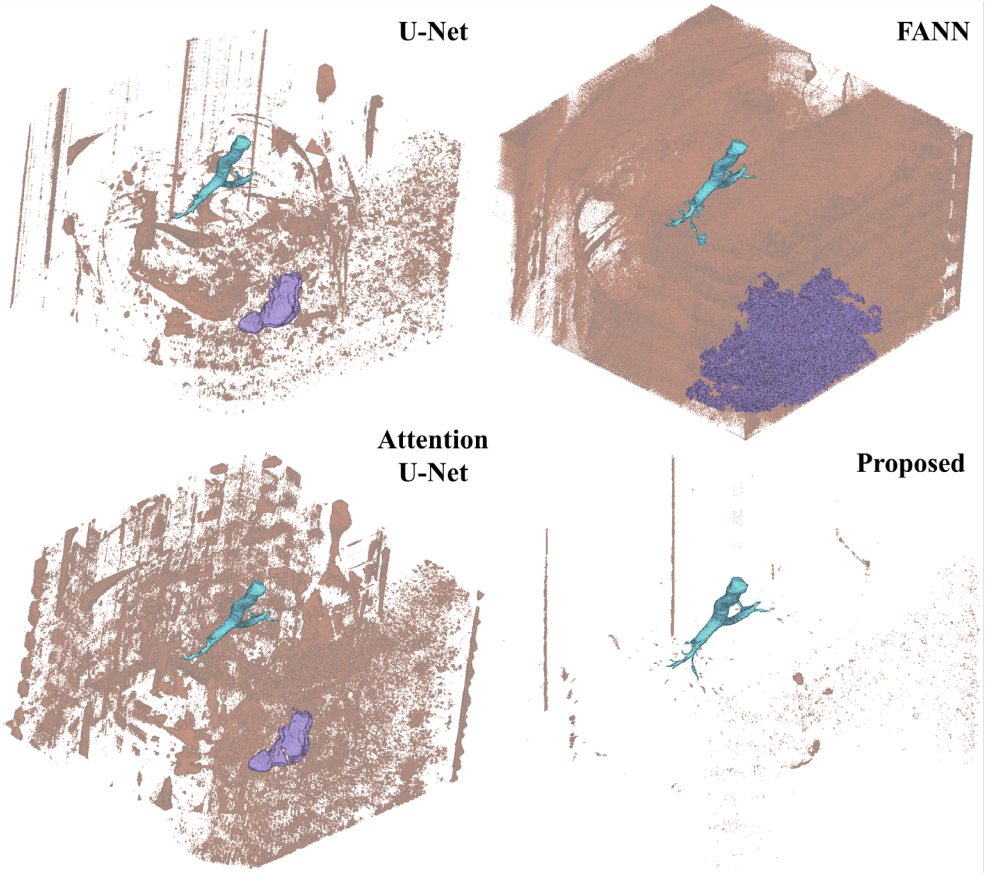

Figure 1. Visualization of airway segmentation results in expiratory CT. Compared with U-Net, Attention U-Net, and FANN, the proposed AMGR model shows reduced peripheral noise and improved distal airway continuity, highlighting enhanced structural completeness.

An Attention-Enhanced U-Net Neural Network Model for Airway Segmentation in Expiratory Computed Tomography Images

Objective: To develop an attention-enhanced U-Net model for expiratory CT airway segmentation with improved distal airway continuity.

Methods: We propose a 3D airway segmentation framework incorporating a novel attention gate, Averaged Multi-Gaussian Response (AMGR), optimized for residual volume (RV) CT scans across asthma, COPD, post-COVID-19, and healthy cohorts (n = 120).

Results: The proposed model achieved a high Dice score (0.9592), outperforming state-of-the-art airway segmentation methods (FANN: 0.8782, U-Net: 0.9424, Attention U-Net: 0.9389), while demonstrating robust noise suppression and improved distal airway continuity.

Conclusion: AMGR stabilizes feature fusion in expiratory CT by suppressing peripheral noise and enhancing airway structure–function representation.

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