Seeking an Optimal Approach for Computer-aided Diagnosis of Pulmonary Embolism

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GitHub: https://github.com/JLiangLab/CAD_PE

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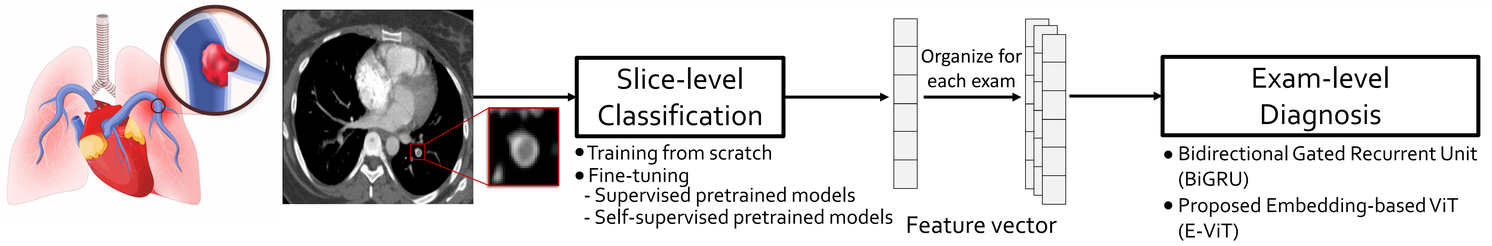
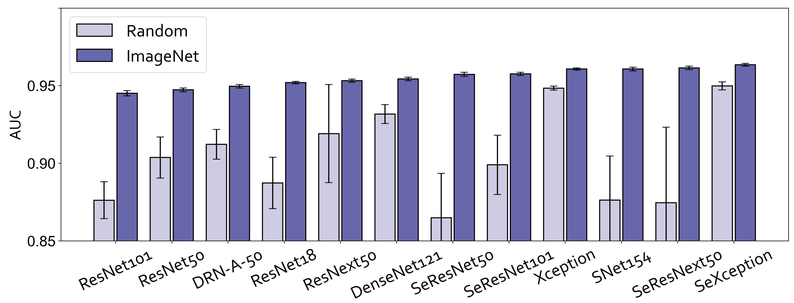
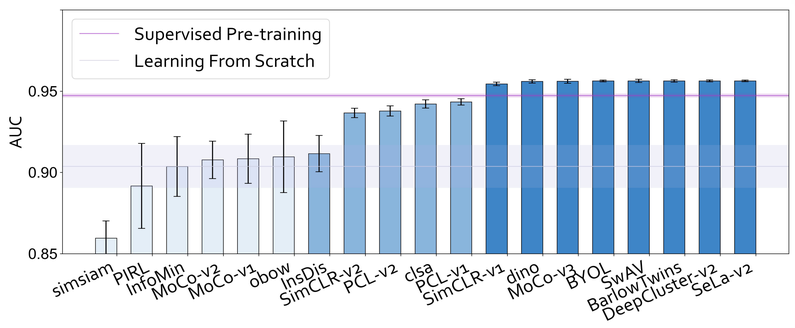
Pulmonary embolism (PE) is a serious condition caused by a blood clot that travels to the lungs, potentially leading to death, demanding accurate and efficient computer-aided diagnosis (CAD). Deep learning holds great promise in CAD for PE. However, numerous deep-learning methods exist for a given task, causing great confusion. **This research comprehensively analyzes competing deep-learning methods for CAD of PE using CT pulmonary angiography.**



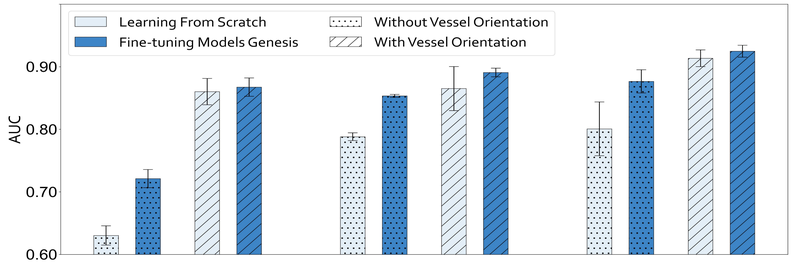
Transfer learning consistently improves performance across the 12 different CNN architectures

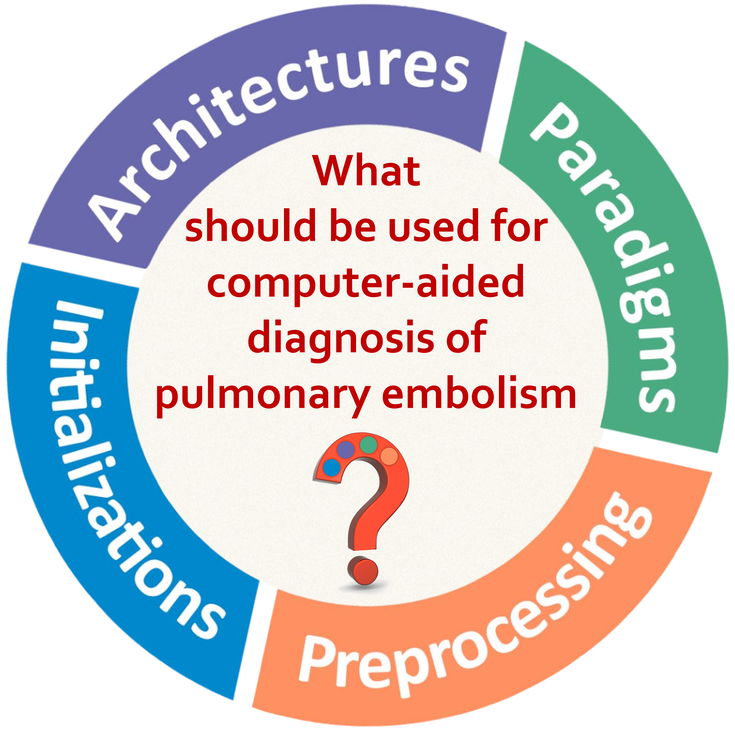


Self-supervised pre-training overtakes (fully) supervised pre-training



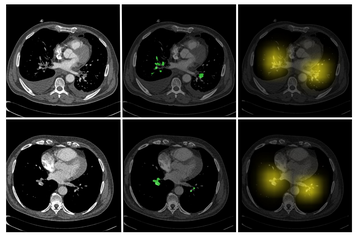
Models Genesis enhances performance across image representations and dimensions



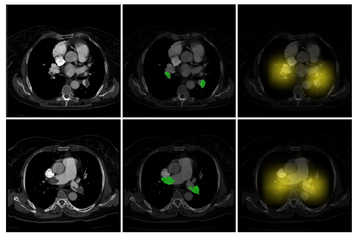


SeXception model trained on RSNA PE dataset shows promising results in localizing PE on new datasets

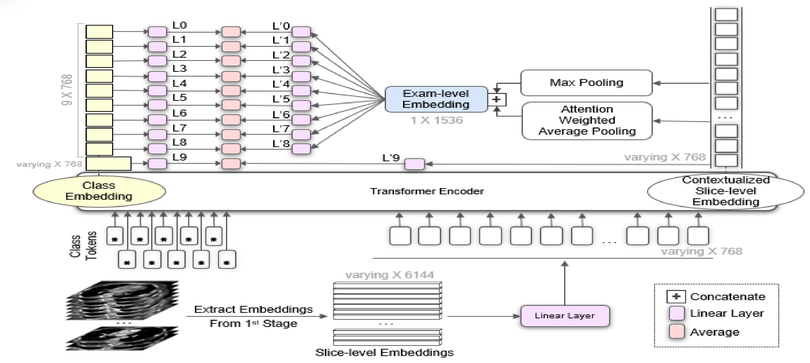
CAD-PE Challenge Dataset

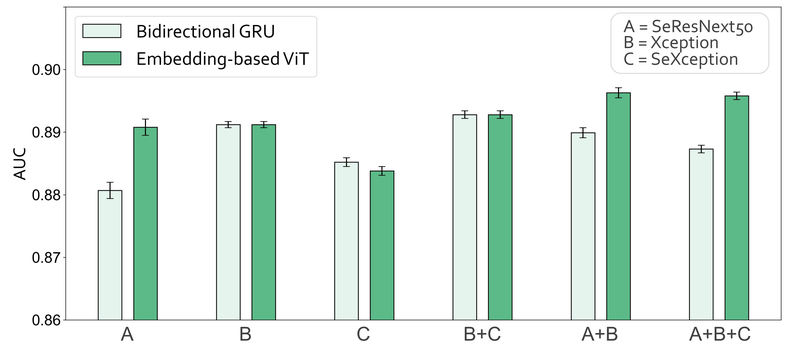


FUMPE Dataset



E-ViT utilizes class and exam-level embeddings generated by the transformer encoder and outperforms BiGRU





Performance improvement through vessel orientation and image dimension incrementation

	Standard Image Representation	Vessel-oriented Image Representation
2D	0.6303 ± 0.0154	0.8602 ± 0.0210
2.5D	0.7881 ± 0.0062	0.8651 ± 0.0352
3D	0.8007 ± 0.0430	0.9135 ± 0.0134

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