Deep-learning based quantification of emphysema on low-dose CT for lung cancer risk assessment

EPOS: C-17190

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Conflict of interest

Head of Research & Development @ contextflow

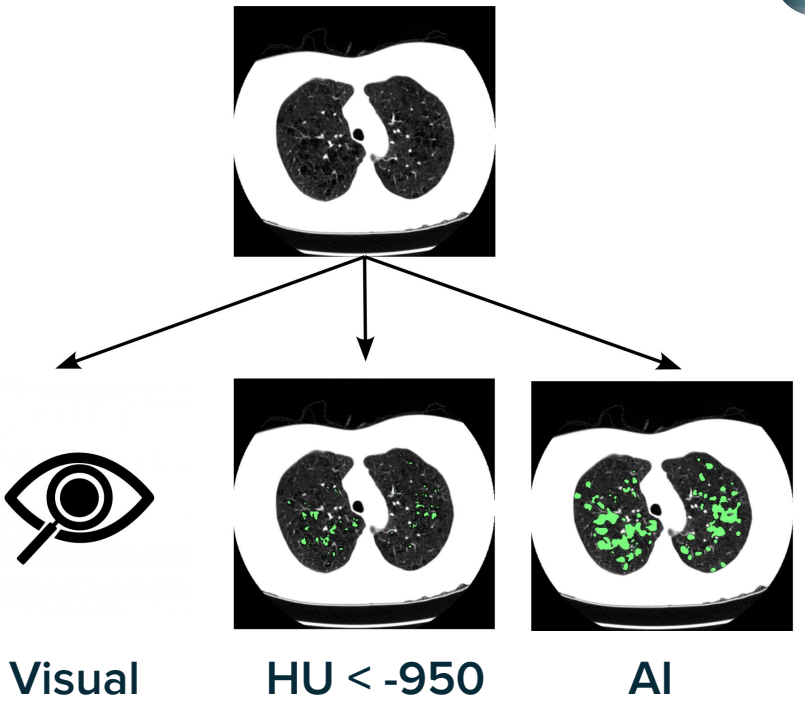
Emphysema in LCS

Why?

- Shared Risk Factors (e.g. Smoking)
- Independent marker for LC risk [1]
- Common incidental finding in LCS

Techniques

- Visual assessment
- Hounsfield unit thresholding
- AI

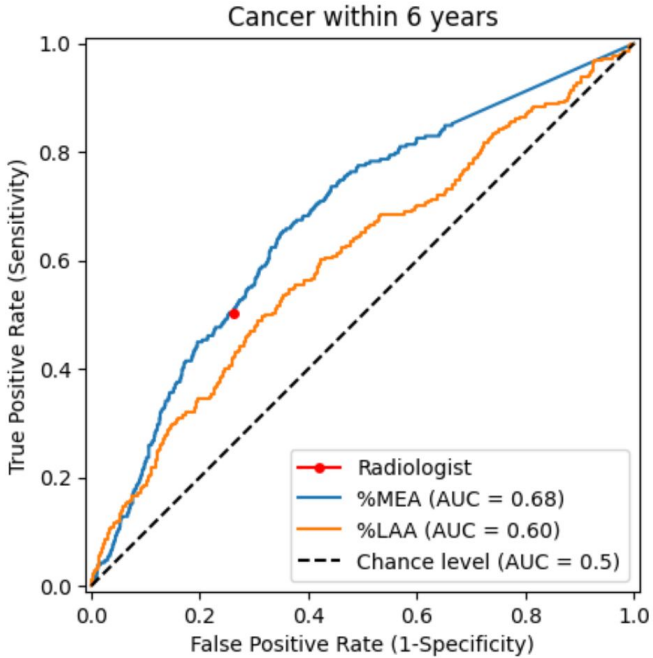


[1] de Torres, J. P., Bastarrika, G., Wisnivesky, J. P., Alcaide, A. B., Campo, A., Seijo, L. M., ... & Zulueta, J. J. (2007). Assessing the relationship between lung cancer risk and emphysema detected on low-dose CT of the chest. *Chest*, *132*(6), 1932-1938.

HU thresholding vs. AI

- 3,446 low-dose CT scans from National Lung Cancer Screening Trial
- Negative baseline scans (not suspicious of lung cancer)
- **%LAA** (Low Attenuation Area) < -950 HU
- **%MEA** (ML-based Emphysema Area) contextflow 3.2.0

- **%MEA is a more effective predictor for lung cancer than %LAA***



* AUC of 0.68 vs. 0.61 for %LAA (P<.001, DeLong-test)

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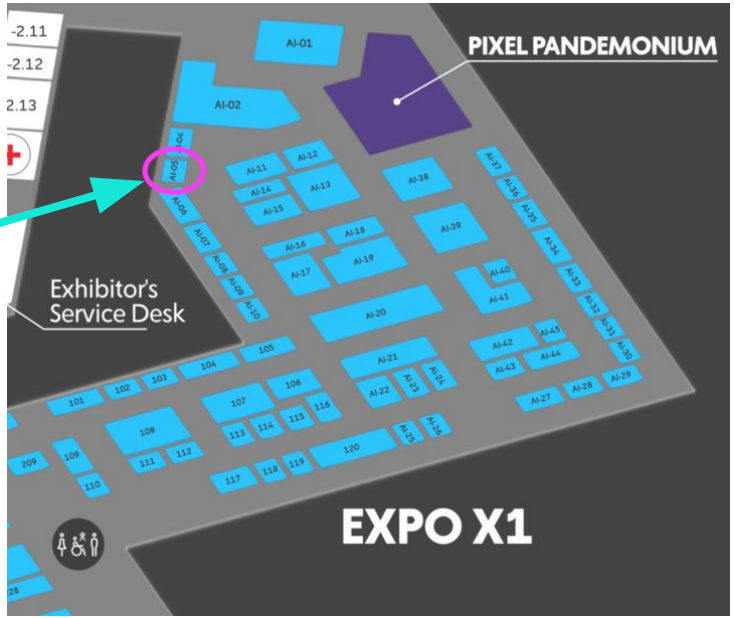

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