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## Algorithm detects, segments lung nodules on CT

By Erik L. Ridley, AuntMinnie staff writer

November 6, 2017 --

Tuesday, November 28 | 10:40 a.m.-10:50 a.m. | SSG13-02 | Room S404AB

In this scientific session, a team from imaging software developer Arterys will present its deep learning-based approach to detecting and segmenting lung nodules on CT scans.

As Arterys was seeking to expand its software platform, the firm interviewed many clinicians and observed them at work. The researchers found that lung CT studies took up significant portions of radiologists' time at many institutions -- yet current software was lacking in functionality and accuracy, according to Felix Lau, a machine-learning scientist at Arterys.

"We noticed several pain points in the workflow which could be addressed with machine learning and access to large amounts of computing power, and set out to build products to assist clinicians in reading these scans," Lau said.

Lung nodule detection and segmentation present a unique challenge for machine learning, he noted.

"In other areas of computer vision, the objects to be detected are dense and often overlap with each other," he said. "But in this case, the nodules are sparsely distributed, and the context around the nodules is an important discriminating feature."

The company trained and tested deep-learning algorithms using an image dataset from the Lung Image Database Consortium.

"The lung nodule detection and segmentation models we developed can help with the early diagnosis of cancer, improve radiologist accuracy and efficiency, and potentially reduce the rates of unnecessary biopsies or missed cancers," Lau said. "Our automated nodule detection method shows high sensitivity and specificity compared with expert radiologists."

Furthermore, the nodule segmentation method provides accurate and volumetric nodule segmentation in 3D at a level comparable to that of expert readers in the Lung Image Database Consortium, he said.

Check out this Tuesday morning talk to learn more about this approach to detecting and segmenting lung nodules.

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