Resources for Lung Cancer Detection Project

**Links**

**Video Tutorial on how to read CT scans:**

<https://www.youtube.com/watch?v=-XUKq3B4sdw>

**Software from video tutorial:**

www.mevislab.de

**Watershed Segmentation:**

<https://www.kaggle.com/ankasor/data-science-bowl-2017/improved-lung-segmentation-using-watershed/discussion>

**Preprocessing Tutorial 1:**

<https://www.kaggle.com/gzuidhof/data-science-bowl-2017/full-preprocessing-tutorial/discussion>

**Demo for FIJI 3D viewer:**

<https://www.youtube.com/watch?v=zqpUYx3guyU&feature=youtu.be>

**UNET for candidate point generation:**

<https://www.kaggle.com/arnavkj95/data-science-bowl-2017/candidate-generation-and-luna16-preprocessing/discussion>

**Using 3D CNNs:**

<https://www.kaggle.com/c/data-science-bowl-2017/discussion/28034>

**Mxnet code:**

https://www.kaggle.com/drn01z3/data-science-bowl-2017/mxnet-xgboost-baseline-lb-0-57/discussion

**External data links**

- http://cmp.felk.cvut.cz/~dolejm1/lungtime/

- http://www.via.cornell.edu/lungdb.html (50 patients, nodule annotations)

- <https://luna16.grand-challenge.org/home/> (manual annotations)

- <https://wiki.cancerimagingarchive.net/display/Public/SPIE-AAPM+Lung+CT+Challenge>

- <https://anode09.grand-challenge.org/> (5 patients)

- <http://www.aylward.org/notes/open-access-medical-image-repositories>

- <http://data.dmlc.ml/mxnet/models> (mxnet models)

- <https://public.cancerimagingarchive.net/ncia/externalLinks.jsf?collectionName=LIDC-IDRI>

- https://wiki.cancerimagingarchive.net/display/ Public/LIDC- IDRI \*\*\* (used in methods paper 1)

**Papers**

**CAD nodule detection 1:**

C. Jacobs and et al. Automatic detection of subsolid pul- monary nodules in thoracic computed tomography images. *Medical Image Analysis*, 18:374–384, 2014.

**CAD nodule detection 2:**

K. Murphy and et al. A large scale evaluation of automatic pulmonary nodule detection in chest ct using local image fea- tures and k-nearest-neighbour classification. *Medical Image Analysis*, 13:757–770, 2009.

**CAD nodule detection 3:**

A. A. A. Setio and et al. Automatic detection of large pul- monary solid nodules in thoracic ct images. *Medical Physics*, 42(10):5642–5653, 2015.

**Other info**

**Nodule Cancer Indicators**

- Older age

- Female sex

- Family history of lung cancer

- emphysema present (dark areas)

- larger nodule size

- location of nodule in upper lobe

- part solid nodule type

- lower nodule count

- Spiculation

- Calcified nodule (very bright) most likely benign