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Deep learning for lung cancer on computed tomography

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Deep Learning for Lung Cancer on Computed Tomography

Early detection and prognostic prediction

Sunyi Zheng

Deep Learning for Lung Cancer on Computed Tomography: Early detection and prognostic prediction

PhD thesis with a summary in Dutch, University of Groningen, The Netherlands

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university of
 groningen

Deep Learning for Lung Cancer on Computed Tomography

Early detection and prognostic prediction

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

This thesis will be defended in public on

Tuesday 22 June 2021 at 11.00 hours

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Abbreviations and acronyms

MIP	maximum intensity projection
2D	two-dimensional
3D	three-dimensional
CAD	computer-aided detection
CNN	convolutional neural network
R-CNN	region with convolutional neural network
RNN	recurrent neural network
ReLU	rectified linear unit
LeakyReLU	Leaky Rectified linear units
GPU	graphics processing unit
HU	Hounsfield Units
CT	computed tomography
LDCT	low-dose computed tomography
LIDC-IDRI	The Lung Image Database Consortium and Image Database Resource Initiative
LNDB	the Lung Nodule Database
LUNA16	Lung Nodule Analysis 2016
Lung-RADS	Lung CT Screening Reporting and Data System
CPM	competition performance metric
ROC	receiver operating characteristic curve
FP	false positive
FROC	free-response receiver operating characteristic
NELSON	Dutch-Belgian Randomized Lung Cancer Screening Trial
DLCST	Danish Lung Cancer Screening Trial
UKLS	United Kingdom Lung Cancer Screening Trial
NLST	National Lung Screening Trial
MILD	Multi-center Italian Lung Detection Trial
ES-NSCLC	early stage non-small cell lung cancer
SBRT	Stereotactic Body Radiation Therapy