

Yutong YAN

MEDICAL IMAGING AND DEEP LEARNING PHD CANDIDATE

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About me

I am a PhD student in IMAGINE team at LaTIM laboratory. My current research interest is **deep learning associated with computer-assisted medical image analysis**, including mammography and ophthalmology image analysis (detection, segmentation, classification etc.) and longitudinal / bilateral information fusion.

Experience

LaTIM laboratory, INSERM

Brest, France

RESEARCHER PHD STUDENT

Oct. 2018 - Exp. Sept. 2021

- Built Deep Learning models for accurate Computer-aided diagnosis, including pathology detection, segmentation and classification.
- Exploit bilateral (multi-view) information fusion from medical images to improve detection performance.
- Exploit prediction of the evolution of lesions with longitudinal follow-up.

IMT Atlantique

Plouzané, France

RESEARCH INTERNSHIP

Mar. 2018 - Oct. 2018

- Implement and optimize different deep learning models (U-Net, SuperCNN etc.) and superpixel algorithms (SLIC, WFI, etc.) for breast mass segmentation from high-resolution digital mammograms.

Laboratoire Hubert Curien

Saint-Étienne, France

RESEARCH INTERNSHIP

Jun. 2017 - Jul. 2017

- Use C language to implement the extraction of the Histogram of Oriented Gradients (HOG) feature.
- Study face and person detection architectures based on convolutional neural network (CNN).

Education

University of Western Brittany

Brest, France

PHD STUDENT IN BIOLOGICAL SCIENCES, HEALTH CARE AND COMPUTER SCIENCE

Oct. 2018 - PRESENT

- Subject: Medical image analysis with deep learning for computer-aided diagnosis in screening.
- Exp. diploma: Doctorate New Regime of Life and Health Sciences.

Télécom Saint-Etienne

Saint-Étienne, France

ENGINEER'S DEGREE IN COMPUTER VISION AND IMAGE PROCESSING

Sept. 2015 - Oct. 2018

- Main courses: pattern recognition, transformations, image registration, numerical calculation, optimization, random signals, statistics, probabilities, etc.
- Experience in Deep Learning and Computer Vision during my internships and projects.

Université Jean Monnet Saint-Etienne

Saint-Étienne, France

MASTER'S DEGREE IN ADVANCED IMAGING AND APPEARANCE OF MATERIALS

Sept. 2016 - Oct. 2018

Xidian University

Xi'an, China

BACHELOR'S DEGREE IN COMPUTER AND INFORMATION SYSTEMS SECURITY/INFORMATION ASSURANCE

Sep. 2012 - Jun. 2016

Skills

Programming Python, C/C++, PyTorch, Keras, Matlab, LaTeX

Industry Knowledge Deep Learning, Computer Vision, Image Processing

Languages Chinese (native), English (TOEIC 850), French (B2)

Publications

Towards improved breast mass detection using dual-view mammogram matching

Journal

MEDICAL IMAGE ANALYSIS

Apr. 2021

- multi-view information fusion can improve computer-aided diagnosis of breast cancer
- a new deep Siamese pipeline is proposed for mass detection from dual-view mammograms
- multi-tasking abilities of deep models are used to learn matching and classification
- dual-view matching improves both patch classification and examination-level detection

Two-stage multi-scale mass segmentation from full mammograms

Conference paper

IEEE INTERNATIONAL SYMPOSIUM ON BIOMEDICAL IMAGING (ISBI) 2021

Apr. 2021

- we present a two-stage multi-scale pipeline that provides accurate mass delineations from high-resolution full mammograms.
- an extended deep detector integrating multi-scale fusion strategy is proposed for automated mass localization.
- a convolutional encoder-decoder network using nested and dense skip connections is employed to fine-delineate candidate masses.
- extensive experiments conducted on public mammography datasets reveals strong robustness against the diversity of size, shape and appearance of breast masses, towards better interaction-free computer-aided diagnosis.

Two-stage breast mass detection and segmentation system towards automated high-resolution full mammogram analysis

Journal

BIOCYBERNETICS AND BIOMEDICAL ENGINEERING

Feb. 2021

- this work is an extension of the conference paper "Two-stage multi-scale mass segmentation from full mammograms" published on ISBI2021
- our framework handles mass segmentation from native full mammograms without any user intervention
- comprehensive supplemental experiments are provided to further validate the proposed method.

Multi-tasking Siamese Networks for Breast Mass Detection Using Dual-View Mammogram Matching

Conference paper

INTERNATIONAL WORKSHOP ON MACHINE LEARNING IN MEDICAL IMAGING 2020

Sept. 2020

- we propose a new multi-tasking framework that combines craniocaudal (CC) and mediolateral-oblique (MLO) mammograms.
- we exploit multi-tasking properties of deep networks to jointly learn mass matching and classification.
- this network is exploited in a full image detection pipeline based on You-Only-Look-Once (YOLO) region proposals.
- experiments highlight the benefits of dual-view analysis for both patch-level classification and examination-level detection scenarios.

Cascaded multi-scale convolutional encoder-decoders for breast mass segmentation in high-resolution mammograms

Conference paper

INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC 2019)

Jul. 2019

- This paper addresses breast mass segmentation from high-resolution mammograms. Mass segmentation is achieved through a multi-scale cascade of deep convolutional encoder-decoders without any pre-detection scheme. Multi-scale information is integrated using auto-context to make long-range spatial context arising from lower scale impact training at higher resolution. Evaluations on high-resolution INbreast images highlights promising model generalizability against standard encoder-decoder strategies.