



Diagnosis of focal liver lesions from ultrasound using deep learning

Submitted by Stéphanie Pinot on Tue, 10/01/2019 - 16:10

Titre	Diagnosis of focal liver lesions from ultrasound using deep learning
Type de publication	Article de revue
Auteur	Schmauch, B [1], Herent, P [2], Jehanno, P [3], Dehaene, O [4], Saillard, C [5], Aubé, Christophe [6], Luciani, Alain [7], Lassau, N [8], Jégou, S [9]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2019
Langue	Anglais
Date	Avril 2019
Numéro	4
Pagination	227-233
Volume	100
Titre de la revue	Diagnostic and Interventional Imaging
ISSN	2211-5684
Mots-clés	Artificial Intelligence [10], Deep learning [11], Focal liver lesions [12], radiology [13], Ultrasound [14]
Résumé en anglais	<p>PURPOSE: The purpose of this study was to create an algorithm that simultaneously detects and characterizes (benign vs. malignant) focal liver lesion (FLL) using deep learning.</p> <p>MATERIALS AND METHODS: We trained our algorithm on a dataset proposed during a data challenge organized at the 2018 Journées Francophones de Radiologie. The dataset was composed of 367 two-dimensional ultrasound images from 367 individual livers, captured at various institutions. The algorithm was guided using an attention mechanism with annotations made by a radiologist. The algorithm was then tested on a new data set from 177 patients.</p> <p>RESULTS: The models reached mean ROC-AUC scores of 0.935 for FLL detection and 0.916 for FLL characterization over three shuffled three-fold cross-validations performed with the training data. On the new dataset of 177 patients, our models reached a weighted mean ROC-AUC scores of 0.891 for seven different tasks.</p> <p>CONCLUSION: This study that uses a supervised-attention mechanism focused on FLL detection and characterization from liver ultrasound images. This method could prove to be highly relevant for medical imaging once validated on a larger independent cohort.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua20280 [15]
DOI	10.1016/j.diii.2019.02.009 [16]
Lien vers le document	https://www.sciencedirect.com/science/article/pii/S2211568419300592?via%... [17]
Titre abrégé	Diagn Interv Imaging

Identifiant
(ID) 30926443 [18]
PubMed

Liens

- [1] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39686>
- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39687>
- [3] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39688>
- [4] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39689>
- [5] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39690>
- [6] <http://okina.univ-angers.fr/ch.aube/publications>
- [7] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=38730>
- [8] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39692>
- [9] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=39693>
- [10] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=5814>
- [11] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25244>
- [12] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=29400>
- [13] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=20312>
- [14] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=7581>
- [15] <http://okina.univ-angers.fr/publications/ua20280>
- [16] <http://dx.doi.org/10.1016/j.diii.2019.02.009>
- [17] <https://www.sciencedirect.com/science/article/pii/S2211568419300592?via%3Dihub>
- [18] <http://www.ncbi.nlm.nih.gov/pubmed/30926443?dopt=Abstract>

Publié sur *Okina* (<http://okina.univ-angers.fr>)