

# Organ identification in ultrasound images

Project Management and Software Development  
for Medical Applications

## General Info

Contact Person: Mickael Tardy, Hassan Alhaji

Contact Email: [Mickael.tardy@hera-mi.com](mailto:Mickael.tardy@hera-mi.com),  
[hassan.alhaji@hera-mi.com](mailto:hassan.alhaji@hera-mi.com)

## Project Abstract

Medical ultrasound (US) imaging is widely used for various organs due its portability, non-invasiveness and low cost. As a result, US image datasets often contain tremendous amount of images, representing multiple body parts [1]. In this project, we focus on one key aspect of the cleaning process of any US dataset: the task of organ identification, with a specific focus on detecting breast ultrasound images.

## Background and Motivation

Breast US imaging is frequently performed to provide guidance for biopsies in the breast cancer detection process. However, the widespread availability of this imaging technique presents a challenge in cleaning large US datasets, as clinicians often capture images of multiple organs in a single session. In this project, we will use computer vision techniques to recognize the breast ultrasound images in datasets like in [2],[3],[4] and [5].

## Student's Tasks Description

In this project, you will be asked to build a tool that performs a triage in any US dataset. The tool should analyze the US images (i.e. text recognition and region-of-interest shape analysis, etc.) to recognize the organ in it. You will have an opportunity to explore text recognition

techniques, image processing tools and potentially deep learning techniques to automatically recognize the organ in the US images.

## Technical Prerequisites

- Basic Computer Vision knowledge, e.g. text recognition and image processing
- Programming skills in Python
- Machine learning knowledge is good to have

## References

[1] Reddy, D. S., Rajalakshmi, P., & Mateen, M. A. (2021). A deep learning based approach for classification of abdominal organs using ultrasound images. *Biocybernetics and Biomedical Engineering*, 41(2), 779-791.

[2] <https://www.kaggle.com/datasets/dasmehdixtr/dti-thyroid-ultrasound-images>

[3] <https://hc18.grand-challenge.org/>

[4] <https://dataverse.telkomuniversity.ac.id/dataset.xhtml?persistentId=doi:10.34820/FK2/QVCP6V>

[5] <https://www.kaggle.com/datasets/aryashah2k/breast-ultrasound-images-dataset>