

An AI-assisted decision making system for thyroid nodule classification

Concept Presentation

The Motive

The dominant way of determining the category of a thyroid module is a Fine Needle Aspiration (FNA) biopsy

An FNA procedure is a process involving
Experienced doctors and expensive labs is an
expensive resource

Can we have an inexpensive process to determine if a
specific patient should perform FNA or not?

Yes, With the help of Image Analysis and Artificial
intelligence



The Application

The details of the process involved and the methodologies are still under active research; today we I will present you with the interface of this application with the intent of getting useful feedback.



The Application

At the current stage using DDTI and TDID datasets and a simple C-Support Vector Classification, we have a success rate of ~80%. The current state of the project involves the combination of multiple different prediction techniques and image filters to the scans, and the study of their affect on the success rate.



The process

The application, from an operators perspective, will have
The following workflow

- Log in to the system
- Navigate into the relevant menu
- Upload a scan of a known patient
- Submit a 'Prediction Task' into the system
- Wait for a couple of seconds, as its task is scheduled to be completed on a First-Come-First-Serve basis
- View the results, a prediction(TIRADS Classification) , and possibly some useful statistics about the scan

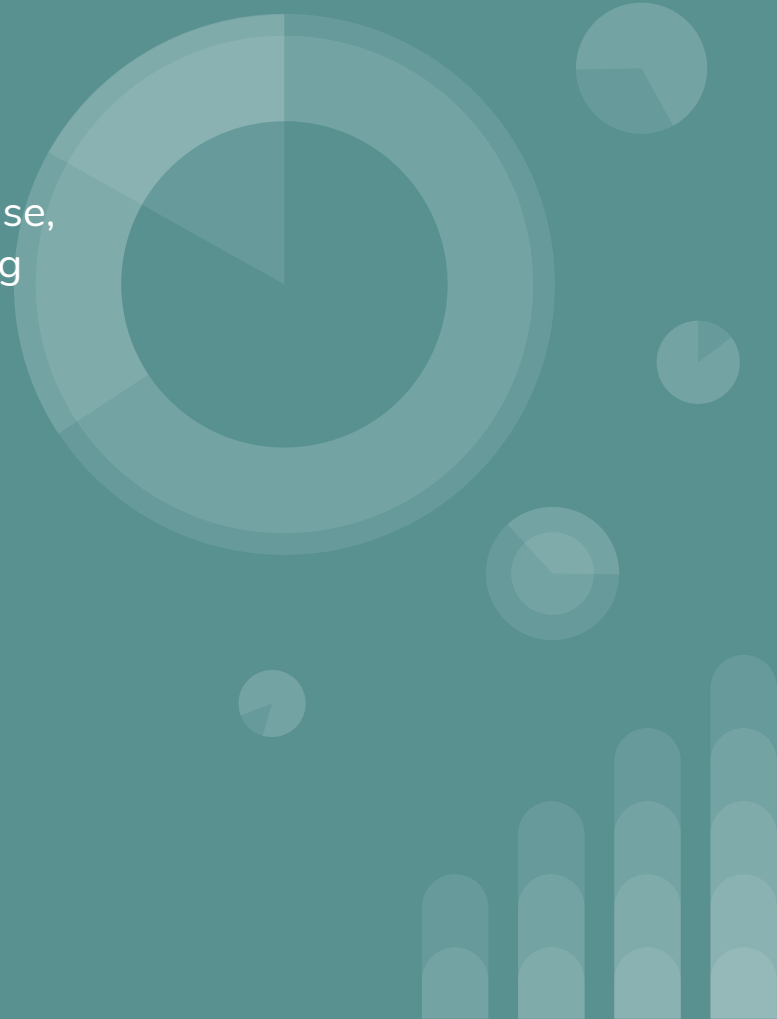
The radiologists will have the option to agree or disagree with the prediction by writing a short paragraph and submitting it for our team to use as a feedback loop for improvement



The process

Additionally , Doctors could save the results for later use, and associate a scan with a patient, possibly comparing multiple scans from different time periods, in order to determine the progress of this specific patient

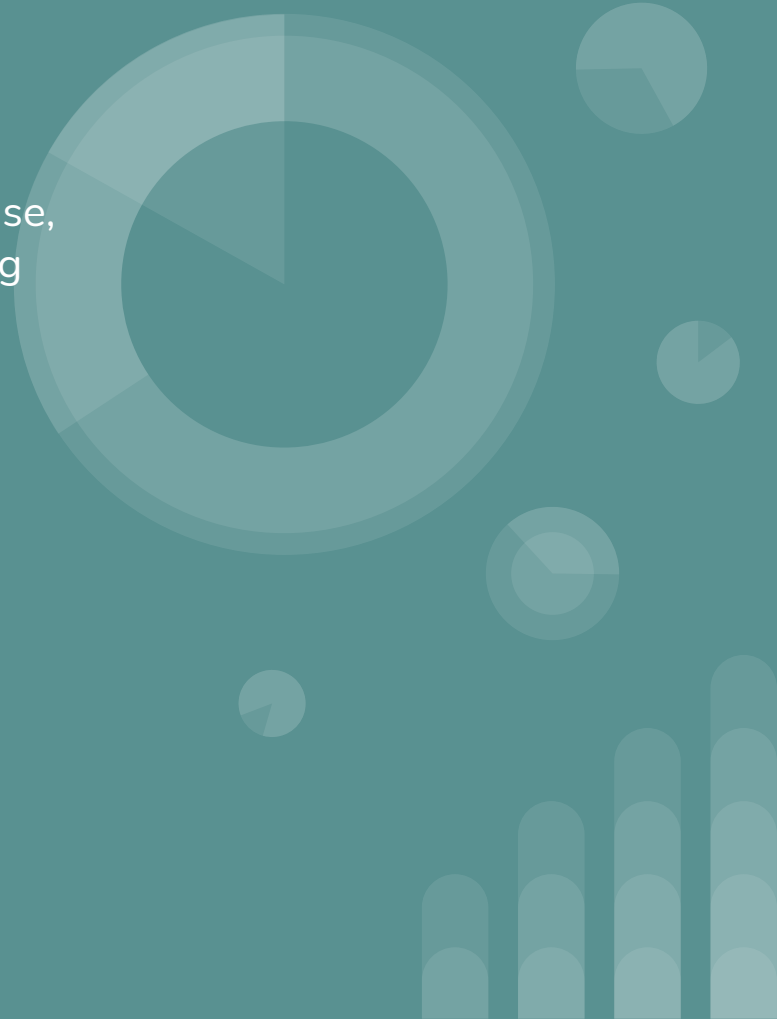
Suggestions for additional features that can make the workflow of doctors easier are, of course, welcome



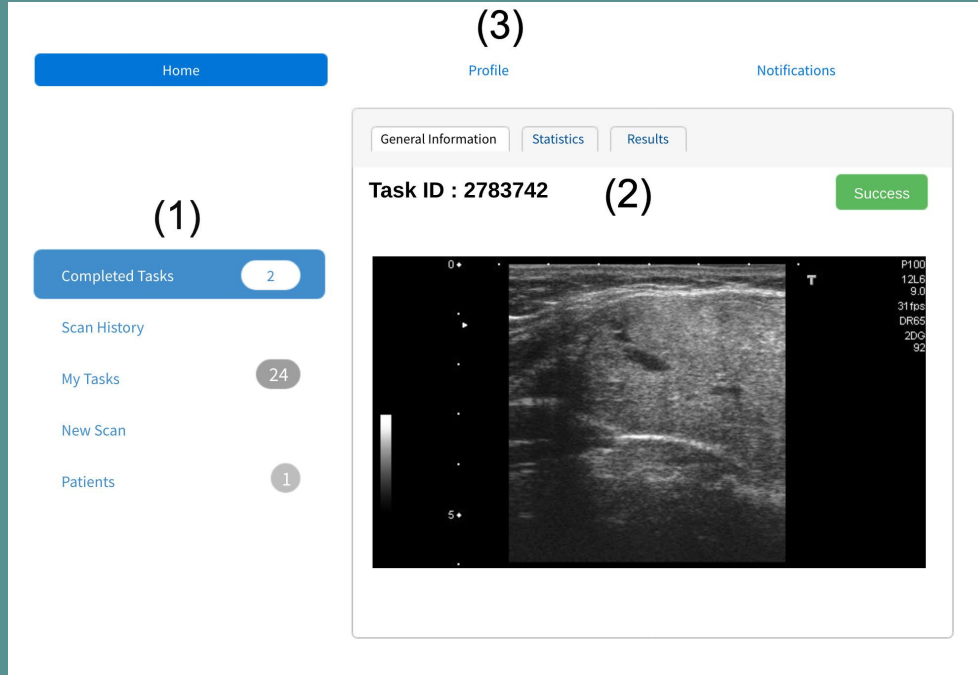
The Interface

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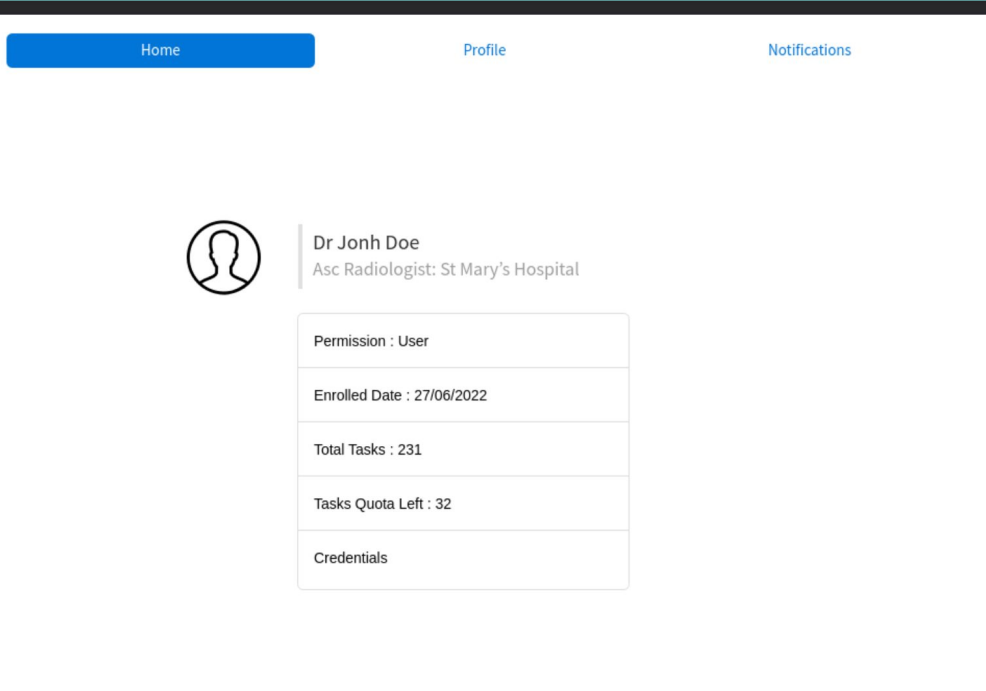


The Interface



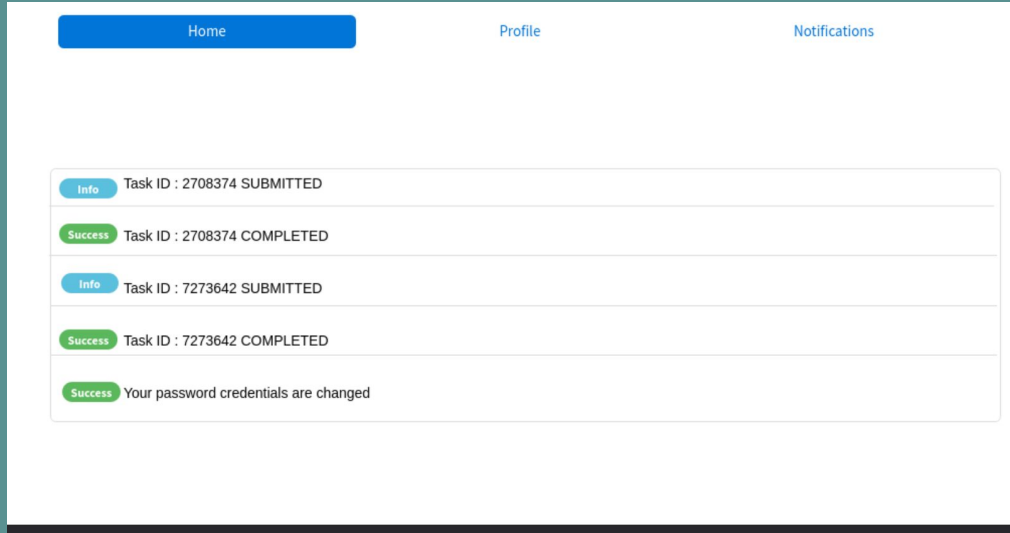
- (1) Action Area. The Area that a doctor will perform a new action, such as uploading a new scan and submitting a new task to the system
- (2) The information area contains the information selected by a particular action. In this scenario, a completed task shows its results
- (3) The System Information Area may be used by used to extract useful info about the current state of the system

The Interface



User Information Area. Various useful information regarding the user can be found here, such as the total tasks, tasks quota, name, and permission information

The Interface



User Notification Area. From this are the user may be informed about the progress of their submitted tasks as well as the system status

Feedback

We would like to hear about the UI structure, features, and possible additions and statistics that may be of interest to the doctors

Stefanos Stefanou, Undergraduate Computer Scientist, University of Reading
UK.

Thank you

