

# Practical block III: Grand Challenge

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## **Practicum and System Requirements**

Please note that the session will be performed in python using Keras with TensorFlow Backend. Both Tensorflow 1.x or 2.x versions can be used (TF 2.x is recommended). Code using other programming languages will not be evaluated. The use of Google Colab is allowed.

A basic guide for installing Keras 2.3.1 and Anaconda can be found in a separate document in the campus virtual.

Practical session will be performed individually. Please code using python jupyter, in order to facilitate the results comparison.

## **1. Introduction**

Challenges in medical image analysis became popular after the organization of the Grand Challenges for Medical Image Analysis at the MICCAI conference in 2007. Hosting challenge events quickly became commonplace at conferences such as MICCAI, ISBI, and SPIE Medical Imaging, amongst others, have hosted challenge events. Leading journals such as IEEE Transactions on Medical Imaging and Medical Image Analysis have welcomed overview papers that described the results of individual challenges.

Since 2010 Grand Challenge webpage bring all information on challenges in the domain of biomedical image analysis available at one place.

<https://grand-challenge.org/challenges/>

Filter Challenges

269 challenges found

**Chest XR COVID-19 detection**  
160 participants, 126 articles  
grand-challenge.org | 2021

**MIDOG Challenge 2021**  
161 participants, 246 articles  
Article | grand-challenge.org | 2021

**QUBIQ2021**  
299 participants, 385 articles  
grand-challenge.org | 2021

**EMSIG**  
9 participants, 1 article  
grand-challenge.org | 2021

**WSSS4LUAD**  
364 participants, 1,394 articles  
grand-challenge.org | 2021

**SARAS-MESAD**  
164 participants, 41 articles  
grand-challenge.org | 2021

**DFUC2021**  
101 participants, 646 articles  
Article | grand-challenge.org | 2021

**AutoImplant 2021**  
150 participants, 1 article  
Article | grand-challenge.org | 2021

**fastPET-LD**  
61 participants, 34 articles  
grand-challenge.org | 2021

**FeTA Challenge**  
FeTA - Fetal Tissue Annot...  
298 participants  
grand-challenge.org | 2021

**Breast Cancer Segmentation**  
347 participants  
grand-challenge.org | 2021

**NuCLS**  
225 participants  
grand-challenge.org | 2021

## 2. Aim of the practical session

In this practical session the students are required to choose a challenge.

The first task consists in analyzing in depth the state of the art (SOTA) of the challenge, usually summarized in a paper reporting the results. The research performed by the student was already presented by the students during the presentation activity of the course).

The student should choose one of the method of the SOTA and is required to implement one of the technique proposed by a challenge participant. The choice of the method should be done in such way to be feasible in the few weeks of the third practical session.

Suggestions: to speed up the computations the student might want to reduce the resolution of the images

it is not expected to obtain the same results of the challenge participant, but to illustrate the attempt to replicate the same network.

Of course the simple use of the open-source code of a challenge participant is not allowed, and the student is supposed to implement the technique starting from general purpose algorithm implementation (for instance those available at [keras.io](https://keras.io))

### 3. Deliverable

Submit a **SHORT** report, commenting your results using markdown of python. No need to include the original dataset images.

**IMPORTANT, only files delivered using the campus virtual will be evaluated. Please upload in the corresponding task your file before the dead line**  
**IN CASE YOU HAVE NO ACCESS TO THE CAMPUS VIRTUAL please contact the professor of the practical course to solve the issue.**