Contribution ID: **18** Type: **Presentation short (15 min)**

MSSEG-2: A medical imaging challenge on VIP

Thursday, 21 October 2021 11:45 (15 minutes)

Scientific challenges (competitions) bring together numerous research teams who work on solving a common scientific hard problem. During the challenge, their solutions are evaluated on a given set of data according to the guidelines given by the organizers.

The automatic segmentation of tissus, structures and lesions in MRI brain scans is a challenging task for improving medical decision making. This is particularly prominent for the quantitative follow-up of Multiple Sclerosis (MS) patients. Then, the automatic detection of MS brain lesion was selected as a topic for a scientific challenge at the MICCAI conference in 2016. Following its success, and to evaluate the progress of computerized solutions accomplished in the last five years, especially impulsed by machine learning techniques, a second similar challenge (MSSEG-2, https://portal.fli-iam.irisa.fr/msseg-2/) is being organized at MICCAI 2021, this time for the detection of new MS lesions appearing between two patient's visits. The challenge uses data provided by OFSEP (http://www.ofsep.org/en) and the data management and processing infrastructure promoted by France Life Imaging (https://portal.fli-iam.irisa.fr/) comprising Shanoir and VIP.

The Virtual Imaging Platform (VIP, https://vip.creatis.insa-lyon.fr) is a web portal for medical simulation and image data analysis. Hosted and provided by the Creatis laboratory, VIP is part of the FLI-IAM infrastructure and also a service of the EOSC (https://providers.eosc-portal.eu/service/creatis.virtual_imaging_platform) participating in the EGI-ACE project. VIP leverages resources available in the Biomed Virtual Organisation of the EGI e-Infrastructure to offer an open service to academic researchers worldwide. VIP currently counts more than 1300 registered users. Shanoir is used to store the anonymized patients images, the corresponding annotated images indicating the lesions (the ground truth hidden to the challengers) and the automatic differential lesion maps provided by the challengers algorithms processed for the final comparison.

In the context of the MSSEG-2 challenge, the registered research teams provide their algorithms to the VIP team, who imports them into VIP and has them executed on the available resources. To facilitate the integration of new algorithms, we rely on containers and Boutiques descriptors, as described in the guidelines provided to the challengers : https://gitlab.inria.fr/amasson/lesion-segmentation-challenge-miccai21/-/blob/master/SUBMISSION_GUIDELINES.md

At the time of submitting the abstract, algorithm integration is work in progress. 46 research teams registered to the challenge, i.e. possibly more than 46 algorithms to integrate in VIP. Although the VIP team has extensive experience with deploying applications on EGI resources, the organization of such a scientific challenge brings new challenges for us, too. The presentation will give more details on these challenges and the solutions deployed to successfully execute the algorithms provided by the challengers, such as access to GPU ressources, as well as the use of CVMFS and udocker.

Speaker bio's:
Sorina Pop is a CNRS research engineer at Creatis, currently in charge of the Virtual Imaging Platform (VIP). Since her Ph.D. degree in 2013, her activity has been focused on optimizing the execution of medical image processing applications on heterogeneous distributed systems. In the last few years, she has been particularly interested in enhancing open and reproducible science through her VIP activities, but also through other projects such as the EU OpenAIRE-Connect and EGI-ACE projects and the France Life Imaging (FLI) platform, where she is also member of the steering committee of the Information Analysis and Management node.

By submitting my abstract, I agree that my personal data is being stored in accordance to conference Privacy Policy

Most suitable track

Delivering services and solutions

Primary authors: Dr POP, Sorina (CNRS); BONNET, Axel (CNRS); Mr MASSON, Arthur (Inria); Mr KAIN, Michael (Inria); Dr DOJAT, Michel (INSERM); Dr COMMOWICK, Olivier (Inria); Dr CERVENANSKY, Frédéric (Creatis)

Presenters: Dr POP, Sorina (CNRS); BONNET, Axel (CNRS)

Session Classification: Delivering Services and Solutions - Presentations