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Pixyl winner of the Société Française de Radiologie Data Challenge 2019

Placing first in an ambitious challenge to predict multiple sclerosis patient disability from a single MRI image, Pixyl establishes itself as a leader in the field of AI for neuroimaging analysis.

Pixyl, a Grenoble-based start-up originating in the French labs Inria and Inserm, accompanied by a team of neuroradiologists and academics, distinguished itself in the AI challenge held during the 2019 edition of the Journées Francophone de Radiologie, which took place from 11 to 14 October in Paris.

It is a noteworthy achievement for the Pixyl team, who delivered both the fastest and most accurate predictions of two-year clinical disability from the MRI of a multiple sclerosis patient. They shared the podium with renowned international competitors.

"It was a particularly difficult challenge, only a third of the companies registered managed to deliver a result within the allocated time, and yet the stakes are of paramount importance. Multiple sclerosis remains the leading cause of non-traumatic disability in young people and represents the most important cost to society in terms of neurological diseases. The use of MRI image analysis is an important step forward in assessing and predicting clinical disability and thus optimally personalizing treatment."

*Professor François Cotton
President of the French Society of Neuroradiology*

SFR Data Challenge

This year, the French Society of Radiology (SFR), represented by Professor Nathalie Lassau, organized three *Data Challenges*:

- Classification of scanner images with a nodule less than or greater than 100mm³ (3D scanner)
- Calculation of muscle surface area for sarcopenia (2D scanner)
- Prediction of disability in patients with multiple sclerosis from Flair MRIs

These data challenges brought together 20 multidisciplinary teams (data scientists, radiologists, researchers and domain experts) in order to develop the best Artificial Intelligence algorithm on imaging databases prepared for the occasion. The teams received a first set of training data one month prior to the congress, and then a second set of data on the first day of the event. The validation data set was made available at 13:00 on Sunday 13th October, and results needed to be submitted by 15:00 the same day.



The challenge in multiple sclerosis was extremely ambitious, considering the heterogeneity of the data (2D flair, 3D flair, multi-centric), the question posed (there is no established imaging biomarker between clinical disability and imaging), and the result turnaround time of two hours to predict disability on 500 patients. Only one third of the participants submitted the results within the time limit.

The Pixyl - CHU Grenoble Alpes - GIN - GHICL Lille team won the data challenge for multiple sclerosis. IBM and Owkin took home the awards in the other challenges.

The Team

The strength of Pixyl's team lies in its multidisciplinary nature, with a team of neurologists from the Groupement Hospitalier de l'Institut Catholique de Lille (Prof. Sébastien Verclytte, Dr. Lucie Colas, Dr. Juliette Ding, Prof. Jean-François Budzik) and the CHU Grenoble Alpes (Dr. Arnaud Attye), with academic support from the GIN (Grenoble Institut de Neuroscience) (Prof. Emmanuel Barbier Ph.D, Stenzel Cackowski Ph.D. student), and the UGA (Felix Renard Ph.D.).

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