Titre du stage / Title of internship

Français :
Developements de nouvels outils de l'apprentissage automatique pour classification, analyse et interprétation des images en orthodontie

Anglais :
Development of new Machine Learning methods for classification, analysis and interpretation of images for Orthodontics

The main idea is to continue to develop new methods of ML for classification, analysis and interpretation of different kind of orthodontics images such as:

- Lateral x-rays radiography for
  -- determining the degrees of maturation of the vertebra;
  -- automatic contouring the the vertebra;
  -- automatic cephalometric analysis, etc.

- Panoramic x-rays radiography -- for automatic contouring the teeth; -- classification of degree of inclination of incisives;

- The main theoretical aspect is related to Interpretable Machine Learning
  a large maxillofacial radiology database (15,000 X ray) has already been launched and ready to use for this study

https://scholar.google.fr/scholar?q=Interpretable+Machine+Learning&hl=fr&as_sdt=0&as_vis=1&oi=scholart

https://christophm.github.io/interpretable-ml-book/

- The work will be done in cooperation with other orthodontics physicans
- https://www.makaremi-orthodontie.fr
- https://www.makaremi-orthodontie.fr/media/articles/artificial-intelligence-applications-in-orthognathic-surgery.pdf

Place:
Due to Covid, main part of the work will be done from home.
A Computer with GPU is available and it can be accessed to run the developed program on image data bases.
with remote access by Teamviewer.
However, once a month, it may be necessary to b e on place at the orthodontics institute of Dr. Makaremi

Indeminization: 700 Euros / month

References:
 https://www.mdpi.com/1099-4300/21/12/1222
 https://www.mdpi.com/2504-3900/33/1/30

https://www.mdpi.com/search?q=&authors=Mohammad-Djafari&journal=&article_type=&section=&special_issue=&volume=&issue=&number=&page=&search=Search

https://jacobgil.github.io/deeplearning/class-activation-maps

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