GaelO Project, an update

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Pixilib
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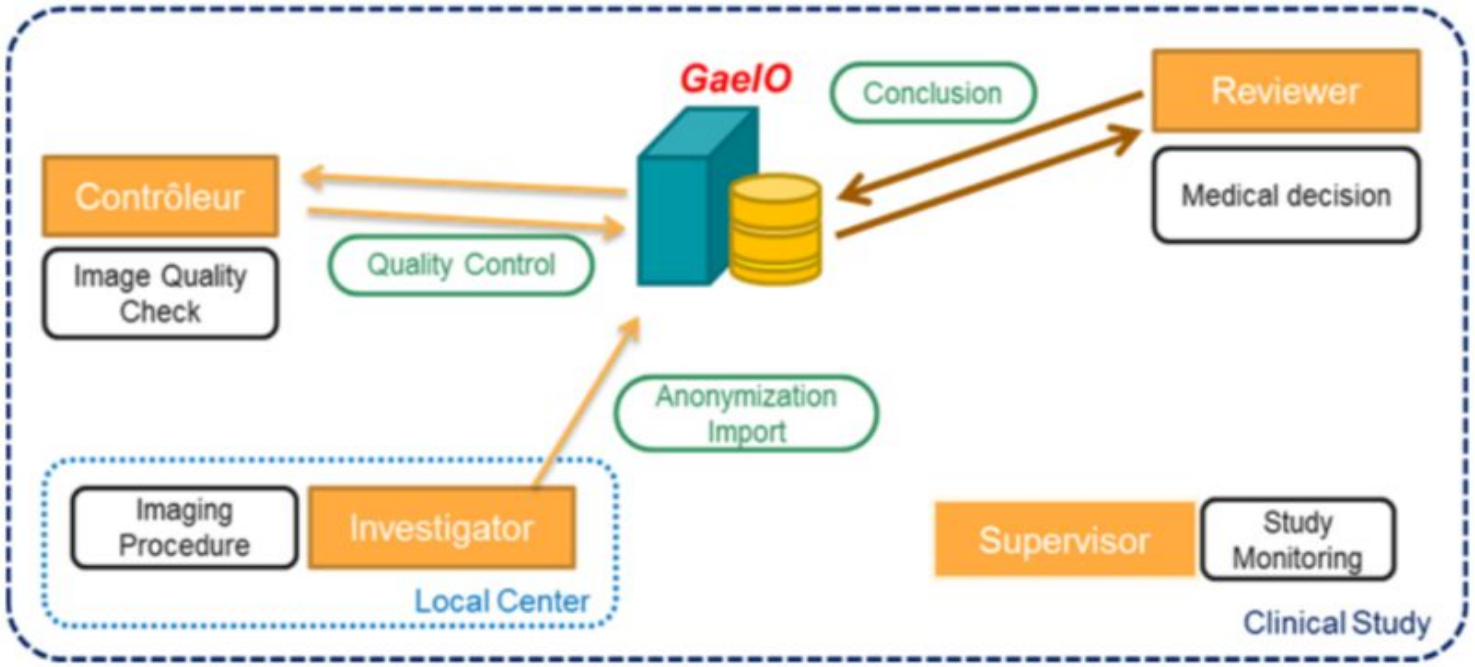
History

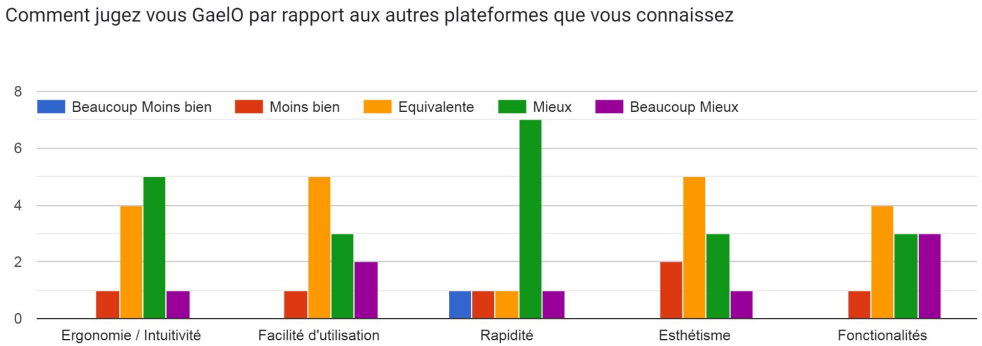
- Solving an imaging data management problem at the lysarc
  - Academic research has no funds to pay industrial imaging CRO services
  - So they work dirty …



Uses Orthanc as DICOM backend
Gael**O** stands for Orthanc

History

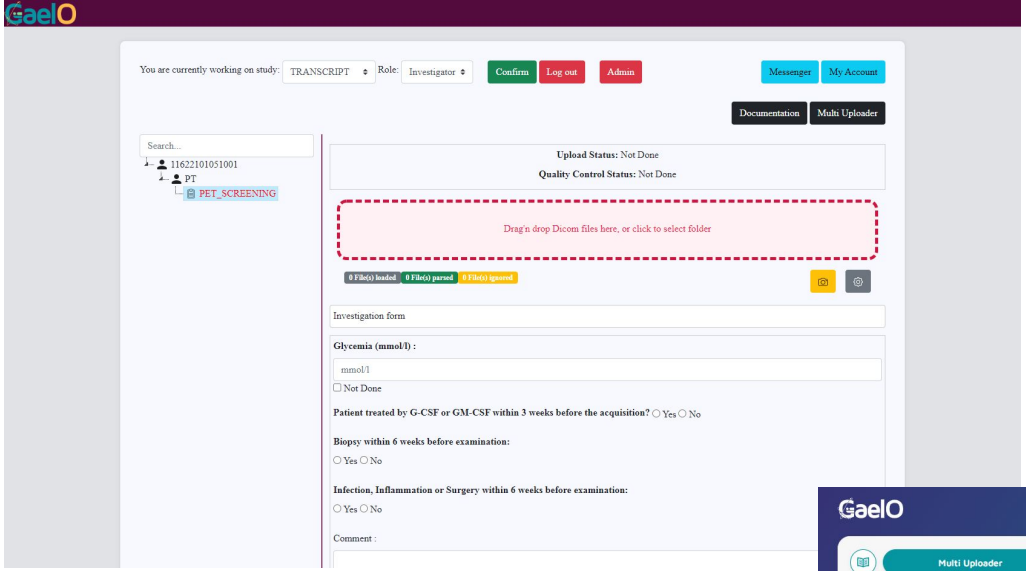
- Building GaelO, a web platform to manage imaging for clinical trials
  - GaelO1 presented at OrthancCon 2019
    - Web application using Orthanc as Dicom backend
    - Written by a physician, PHP, jQuery, no tests
      - But working …
        - At this day GaelO v1 ran 10+ trials, 1500+ dicom studies centralized
      - And with a pretty good user feedback

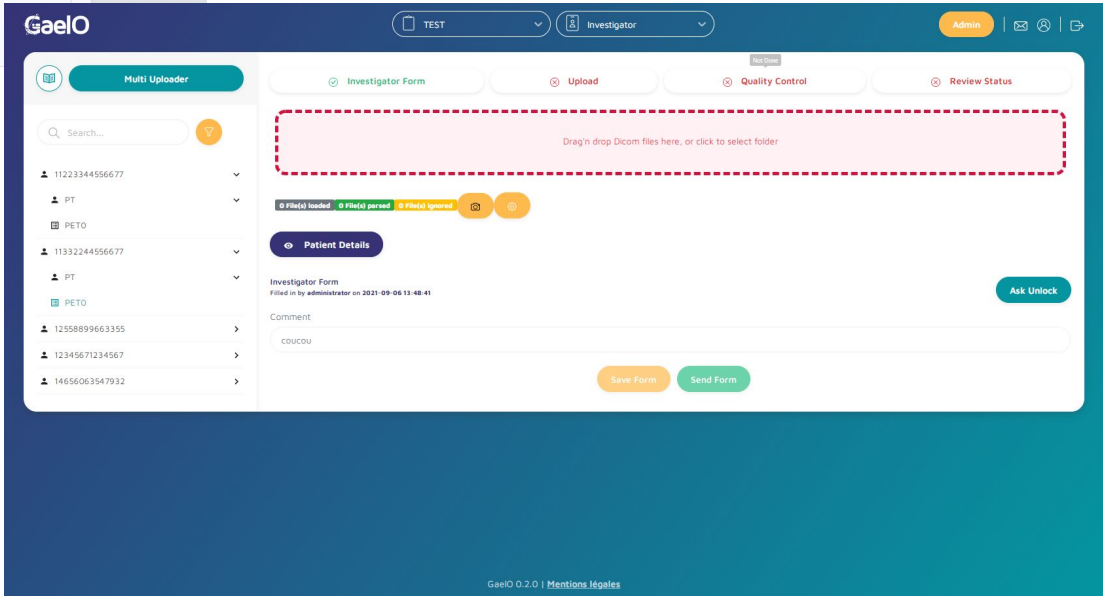


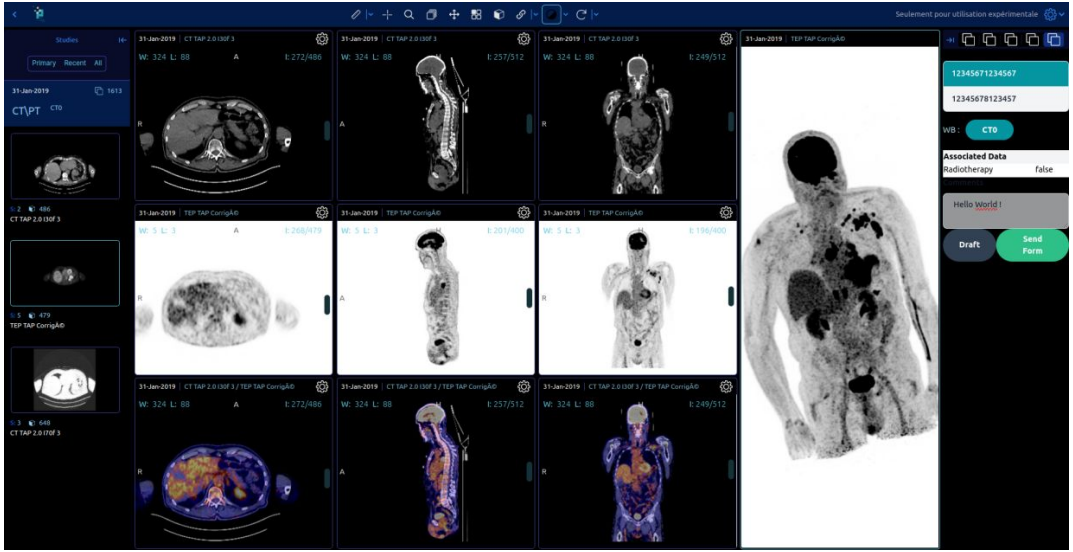
GaelO2

- GaelO2 is a full rewritten of GaelO1
  - Goals :
    - Maintainability
    - Evolutivity
    - Scalability
  - Technologies
    - Rest API backend (PHP, Laravel)
    - React Frontend
    - Tests !

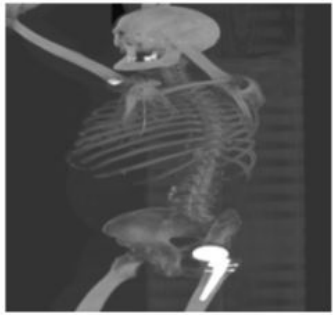
- New features
  - Support of Ancillary Studies
  - AI Inference
  - Qc Report / Magic link / Look and feel …


GaelO
You are currently working on study: TRANSCRIPT
Role: Investigator
Confirm
Log out
Admin
Messenger
My Account
Documentation
Multi Uploader
Search...
11622101051001
PT
PET_SCREENING
Upload Status: Not Done
Quality Control Status: Not Done
Drag'n drop Dicom files here, or click to select folder
0 File(s) loaded
0 File(s) parsed
0 File(s) ignored
Investigation form
Glycemia (mmol/l) :
mmol/l
Not Done
Patient treated by G-CSF or GM-CSF within 3 weeks before the acquisition? Yes No
Biopsy within 6 weeks before examination:
Yes No
Infection, Inflammation or Surgery within 6 weeks before examination:
Yes No
Comment :


GaelO
TEST
Investigator
Admin
Multi Uploader
Investigator Form
Upload
Quality Control
Review Status
Search...
11223344556677
PT
PET0
11332244556677
PT
PET0
12558899663355
12345671234567
14656063547932
Drag'n drop Dicom files here, or click to select folder
0 File(s) loaded
0 File(s) parsed
0 File(s) ignored
Patient Details
Investigator Form
Filled in by administrator on 2021-09-06 13:48:41
Ask Unlock
Comment
coucou
Save Form
Send Form
GaelO 0.2.0 | Mentions légales



CT STD



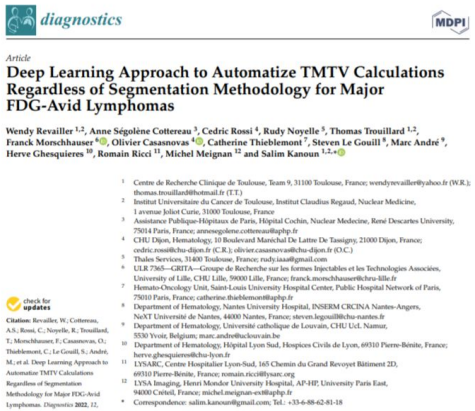
Series Description	CT STD
Modality	CT
Series Date	20230202
Series Time	101014
Acquisition Date	20230202
Acquisition Time	101029.754788
Slice Thickness	2.5
Pixel Spacing	1.042969\1.042969
FOV	534.000128x534.000128
Matrix Size	512x512
Patient position	HFS
Patient orientation	1\0\0\0\1\0
Number of instances	488

It's all good !

See in GaelO

GaelO 2 : Focus on TMTV calculation in lymphoma

- An example of our vision :
  - LYSARC promote 10+ trials / year in lymphoma, >50% academic
    - GaelO has increased the possibility to centralize imaging in these trial
      - Improved quality of studies
      - Collection of large amount of images in lymphoma
  - With collected and annotated data of these trials
    - Trained a segmentation algorithm to automatize TMTV (Revailler et al. Diagnostics 2022)



diagnostics

MDPI

Article

Deep Learning Approach to Automatize TMTV Calculations Regardless of Segmentation Methodology for Major FDG-Avid Lymphomas

Wendy Revailler [1,2], Anne Ségolène Cottereau [3], Cedric Rossi [4], Rudy Noyelle [5], Thomas Trouillard [1,2], Franck Morschhauser [6], Olivier Casasnovas [4], Catherine Thieblemont [7], Steven Le Gouill [8], Marc André [9], Herve Ghesquieres [10], Romain Ricci [11], Michel Meignan [12] and Salim Kanoun [1,2,*]

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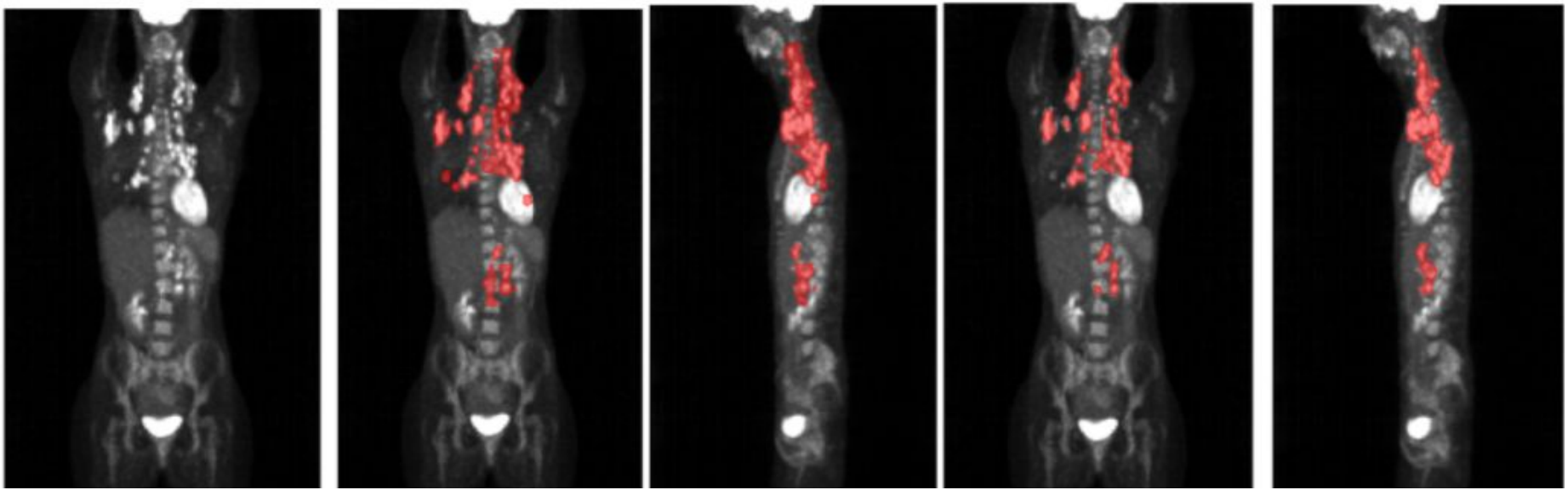
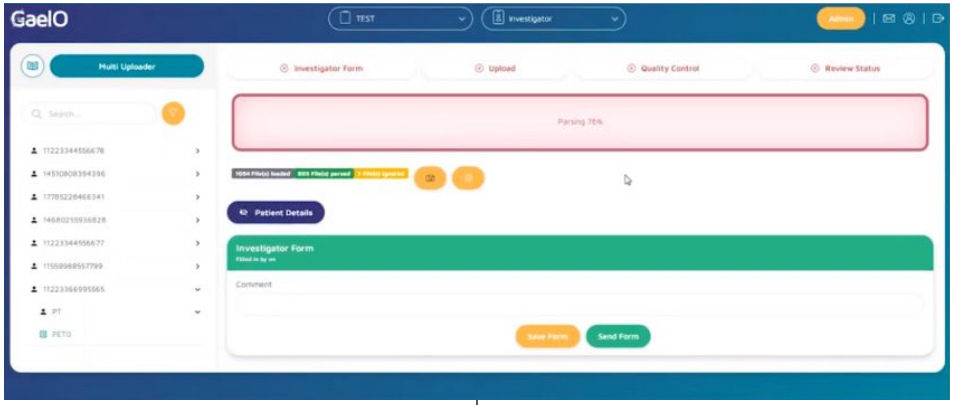
check for updates

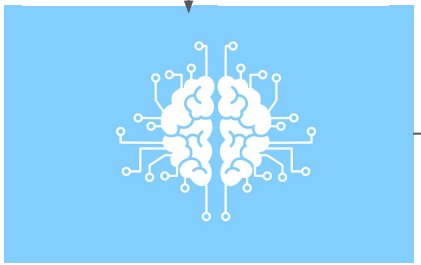
Citation: Revailler, W.; Cottereau, A.S.; Rossi, C.; Noyelle, R.; Trouillard, T.; Morschhauser, F.; Casasnovas, O.; Thieblemont, C.; Le Gouill, S.; André, M.; et al. Deep Learning Approach to Automatize TMTV Calculations Regardless of Segmentation Methodology for Major FDG-Avid Lymphomas. *Diagnostics* **2022**, *12*,

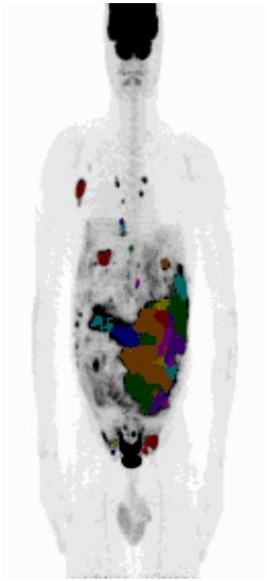
TMTV AI automated calculation



IA integration in GaelO

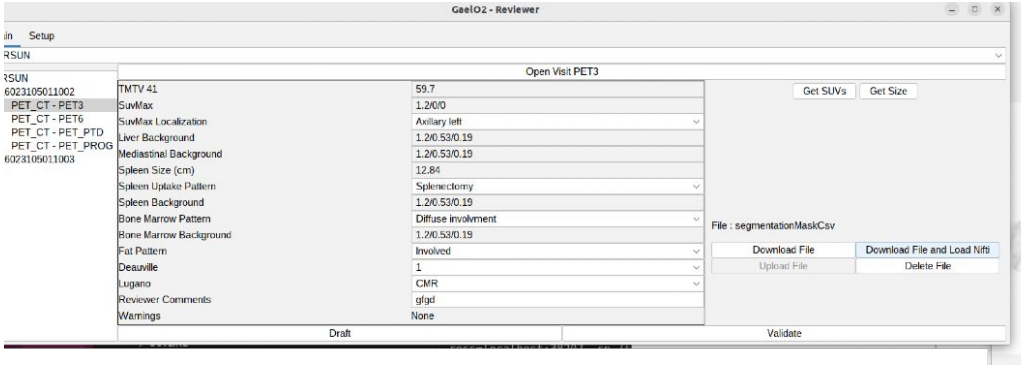


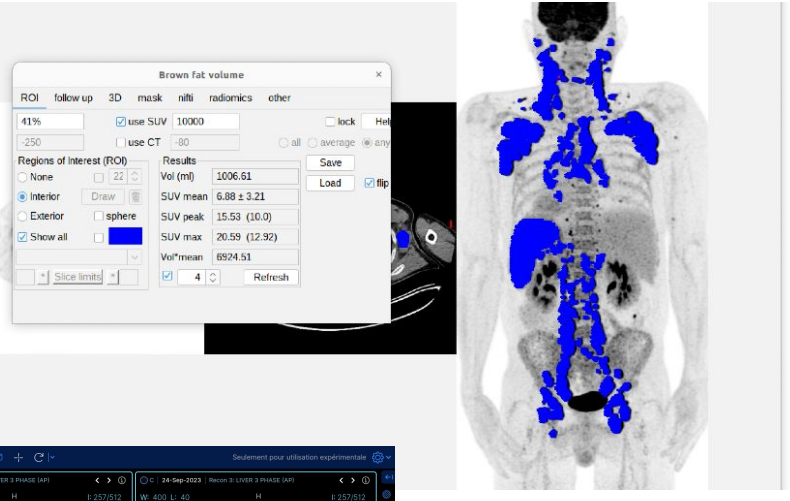


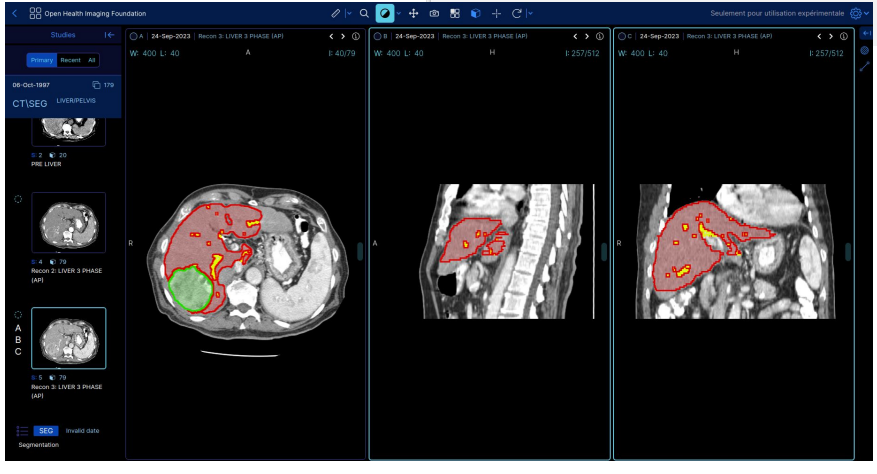


tmtv	1498508.4843155
dmax	515.08

And for nuclear medicine physicians …







And tomorrow with OHIF

GaelO 2 : focus on TMTV calculation in lymphoma

- A clinical trial about to start using TMTV as an inclusion criteria
  - Industry sponsored
  - Calculation of TMTV
    - Prospectively
    - Real time
    - IA automated for patient screening
    - IA aided for final inclusion decision in the trial
  - Made TMTV feasible to push this new biomarker for tailored personalized therapy
    - And maybe improve patient’s outcomes…

Pixilib : a company to edit GaelO

- Pixilib has been created in 2021
  - Because academic research promoters awaiting for a Software as Service solution (no computing department to maintain GaelO themselves)
  - Trying to build a business model that doesn't exist
    - Industrial CRO are focusing in the industrial market (way more profitable)
    - No real offer adapted (feature and pricing) for academic research
    - Try to make a bridging business model
      - Keep small costs to fit the academic market
      - Learn from academic projects to build innovative offers to push new way to integrate medical imaging in industry sponsored trials

- Pixilib is bootstrapped / self funded
  - All incomes are reinvested in our R&D (pay salaries, subcontractors…)
  - No fundraising, no investors

Pixilib : a company to edit GaelO

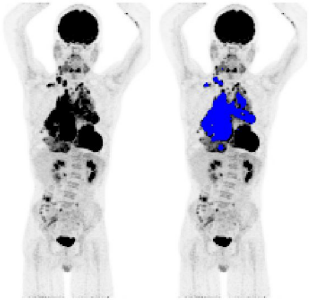
- Pixilib as an open source contributor
  - Funding and participating of some Orthanc features (with Lysarc) :
    - Transcoding
    - DicomWeb metadata api enhancement
    - Anonymization enhancements
    - Stone viewer annotations
  - Funding and participating of some OHIF features :
    - PET/CT Mode
    - RTSTRUCT support
    - Bug fixes (10+ pull requests)

Our product roadmap

OrthancToolsJs => GaelO-Flow

On prem Research PACS + Tools
(DICOM ETL)

GaelO Processing

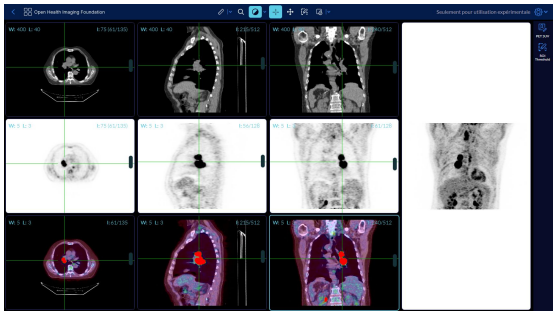


GaelO

IXI LIB

AI Inference & Viewer

Saas web platform for
multicentric clinical trials



GaelO Learning

E-learning solutions for physicians

Conclusions

- GaelO project is now 5y old
  - GaelO2 in production from June 2023
- Started to be a significant actor in academic research in France
  - 15+ trials ; > 50 centers ; > 300 users
  - And first users from other european countries
- A lot of new projects on the roadmap
  - Trying to build software tools fulfilling physicians needs
  - Trying to contribute to the open source ecosystem, pushing them ideas, code contributions and funding
- One goal : Accelerating research with a better inclusion and usage of medical imaging procedures