The Rocket platform
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About us

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Why Rocket?

Trying to transfer knowledge from the academic world to the clinical and Bio environment through Desktop applications.

But, was it the best idea?

- Multiple versions of the software
- Difficult to package apps for the different OS.
- Non organized data
- Data sometimes was lost by the user.

Do the user has to deal with this nightmare?

Can web technologies give us the same? Can they be better?

https://carlosym.github.io/html5_dyssynchrony_tool.github.io/

https://www.youtube.com/watch?v=hMDCSwbkup0&feature=youtu.be
What is Rocket?

Cloud-based architecture that allow us to build customized and user-friendly platforms.

Tools launcher
- Data explorer
- Data viewer
- Atlas variability analysis
- Data fusion tools
- Benchmarking experiments
- Comparison tools

Data manager
- Datasets
- Protocols
- Standards
- Ontologies
- Queries
- Searches

Data analyser
- Intrasubject comparison
- Intersubject comparison
- Reproducibility analysis
- Machine learning algorithms

Collaborative
- Data annotation
- Data sharing
A platform made of components

- The platform is based on a set of independent components that can talk between them.
- Our goal is to isolate the components in containers to be able to deploy the infrastructure in systems like Kubernetes, docker swarm or mesos.
Clinical use case

Problem

• Advancements of drug/device therapies and the ever broader spectrum of clinical symptoms, prognosis and therapies, almost each individual patient needs a targeted and personalised treatment strategy.

• Best-practice is translated into clinical guidelines, experts opinion consensus or scientific publications

• Access and capability of handling this vast information is getting more limited.

Goal

• Provide a flexible access to medical knowledge relevant for the patient

• Easy access to the evaluation of decision trees suggested by professional organisations and literature

• Fetch filtered information of similar or relevant patient cases through quick overview of entire databases
Clinical use case

Patient has some problems and goes to the hospital

The patient is subjected to a set of medical tests

Clinical data of the patient is collected from different tests

Clinical data saved in database

Fast overview and search of clinical data from a large collection of patients organized by projects and disease.

Clinical data of a patient

Process patient data through decision trees in order to predict a treatment

Data interpretation

Fast overview and search of clinical data from a large collection of patients organized by projects and disease.

Data explorer

Visualize and process patient data take measurement and quantifications from data

Annotation tools
Research use case

Problem

• With the fast growing availability of approaches for large and varied biomedical images, the choice of the most appropriate tool for addressing a specific scientific question becomes more and more inefficient.

• There is a need for a flexible and dynamic database of possible approaches towards bioimage analysis that integrates crowd user experiences of the tools.

• Besides this, demo their use in example datasets is as important.

Goal

• Provide a real-time collaborative and structured information

• Sharing interface, pointers to relevant sample datasets

• Online tool execution as well as access to benchmarks and statistical comparison.

• Create a communication channel between people with different background.
Research use case

Sample data collection

1. Human data
2. Biological data
3. Methods and algorithms

Biomedical data browser

Fast overview and search from a large collection of biomedical data organized by projects

Collaborative annotation/tagging application on sample data

Applications manager

Large overview of datasets, data analysis

Data viewer

Large overview of datasets, data analysis

Computation engine

Run experiments and benchmark algorithms in the cloud
How to deal with algorithms

- Some of the research done in the image analysis community end up in an algorithm; Some are automatic; Some of them are open source.

“Open source is nice but is hard”

- Libraries changing every six months
- A big quantity of repositories in Github doesn’t have maintenance
- Sometimes very difficult to install

Why we don’t create a virtual machine with our algorithm/s?
A platform to store and execute algorithms

Input parameters
Input data

Nuclei segmentation filter code

Nuclei segmentation filter image

Storage
Database
Computation engine
Web API

Cells data
Input data
Input parameters

Filter

Output

Coding a new nuclei segmentation algorithm

User on the client side
What do we offer

Launch your Docker

Run pipelines & benchmarks

Link Data and meta data

Central unified user interface

Uncouple machine for user; data; application

Collaborate on data and tools

Contemporary technologies

We could use help with:

- Dedicated Viewers for specific data
- Dockers with ‘isolated’ applications
- Integration of third-party software and solutions (e.g. Omero)
- User management
- Incorporation of standards (files; ontologies; equipment...)
- Linking with relevant communities
- Collaborative projects
Thanks a lot