Horizontal Data Fusion for Integrative Modelling: the MedINRIA Fusion Toolbox

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1. Introduction
- Follow up on an image based diagnosis, superposing simulated volumes and acquired data or multi-modal series all require a “Horizontal Data Fusion”, which registers in the same spatial coordinates different data sets.
- Explosion of data and equal explosion of algorithms, input/output formats, user interfaces and visualisation tools.
- Use by non-experts therefore challenging.
- Need for standards in horizontal fusion.
- Our project at INRIA within the Virtual Physiological Human Network Of Excellence: Toolbox for importation and exportation of registration algorithms, aimed at researchers and clinicians.

2. Architecture
- Core/plug-in architecture
- Experience accumulated in MedINRIA 1.x [1] and VTKINRIA3D [2].
- Core provides abstraction layer for plugins to register and talk to each other.
- API providing Abstract Objects.
- Data linked to multiple readers and writer for more versatility

3. Demonstrator
- MedINRIA-Fusion: subset of a larger platform: MedINRIA.
- Tests integration of registration plug-ins
- Algorithm: rigid transformation estimation, based on the ITK registration framework.
- Comparison tools help diagnosis and test the accuracy of a registration.

4. Conclusions
- VPH Toolkit’s mission: aggregate tools existing in the community.
- Still very young framework, but showed an ease to import an existing algorithm, easy-to-use interface.
- The open API is our first attempt towards standardisation, to federate researchers or developers under the same common language.
- More demonstrators however needed to harden the concept. Next step: interoperate with other toolboxes from the VPH toolkit.

Part of the API Object Hierarchy