



The DIGISCOPE EquipeX project : interactive and collaborative visualization infrastructure for complex data

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PROJET DIGISCOPE



MINISTÈRE
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE
COMMISSARIAT GÉNÉRAL
À L'INVESTISSEMENT

- Fondation de Coopération Scientifique (FCS) du Campus Paris Saclay
- Project manager : Michel Beaudouin-Lafon (LRI Orsay Paris Sud)
- 10 partners – 2011 Equipment Grant from the french gov. : 6 700 000 €

Create a unique infrastructure to study remote collaboration in large interactive rooms

DIGISCOPE

Create a unique infrastructure to study remote collaboration in large interactive rooms

Why ?

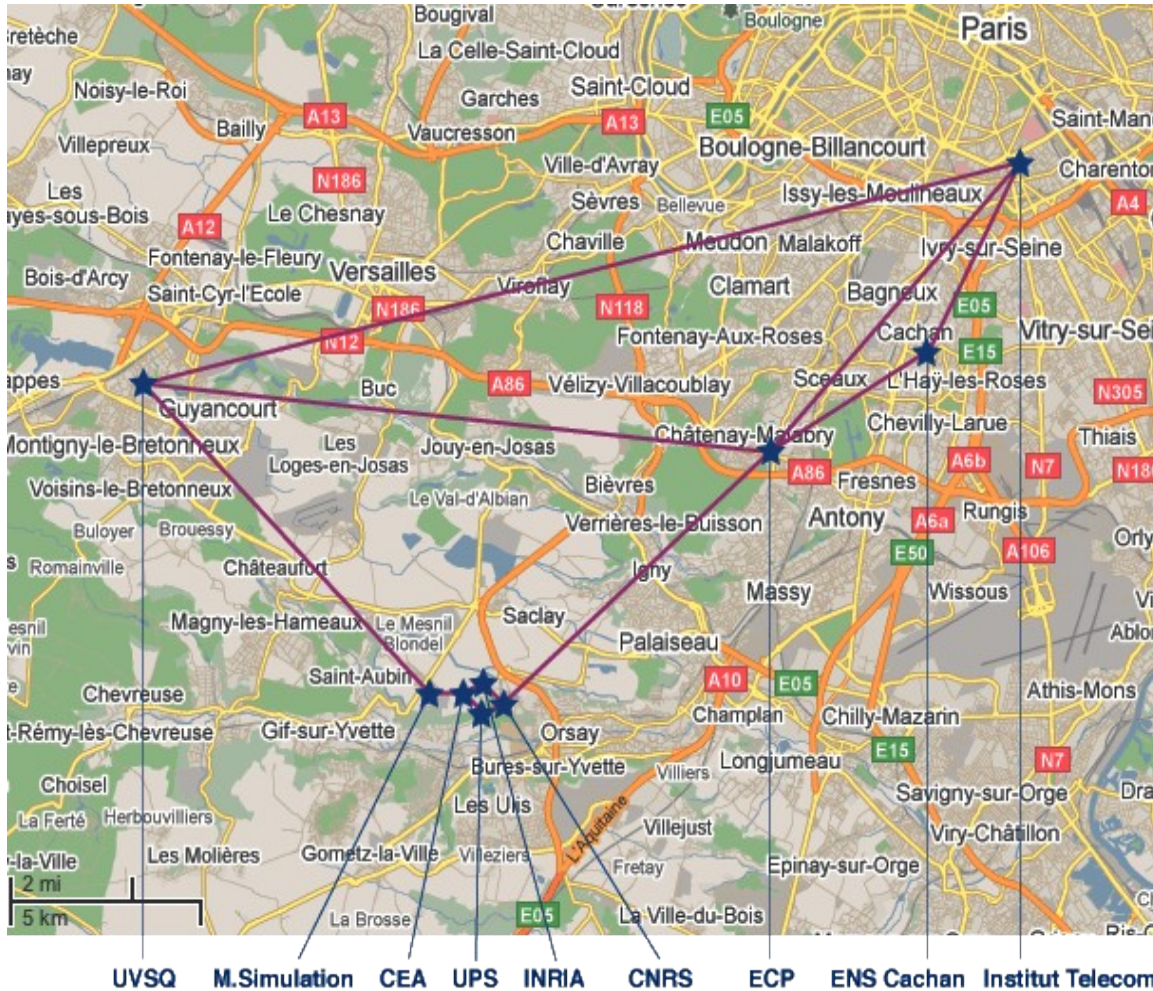
- We believe this technology will become **widespread**
- But for it to be successful requires experimenting in **real-size**, with **real users** and **real problems**
- Digiteo has a unique set of **skills** to solve this **challenge**

9 rooms - all different

- Each room will have:
- Large interactive surfaces
- High-end audio-visual telepresence system
- Access to high-speed networks and HPC facilities



Paris Sud / Saclay network



- Fondation Campus Paris-Saclay
- Université Paris-Sud
- CNRS
- CEA
- INRIA
- Institut Télécom
- Ecole Centrale Paris
- ENS Cachan
- Université Versailles - St-Quentin
- Maison de la Simulation

Industrial support

Current support:

*Orange - Alcatel-Lucent – Dassault Aviation – EDF
Medit – Microsoft – Oxalya – PSA*

New partners can enter the consortium

Need to support the project:

funding, manpower, access to case studies, access
to their own equipment

Scientific discussion

Goals of DIGISCOPE

- 1) Use large-scale visualization facilities as an added-value scientific tool
- 2) Create friendly remote collaborative meeting environments
- 3) Make science attractive for students by means of new high-end systems

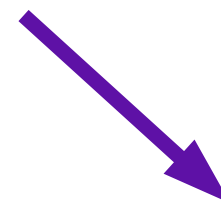
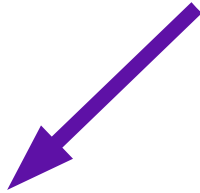
Goals of DIGISCOPE

- 1) Use large-scale visualization facilities as an added-value scientific tool

Focus on it



Consider visualization facilities as an added-value scientific tool ...



... where the
**number of
pixels** is
important

- Scientific discovery in large volume of data
- Multiscale aspects

... where
high-end **user
interfaces** are
important

- 3D
- Intuitive exploration
- Many degrees of freedom

... where
**multiple
views** of the
same object
are important

- High-dimensional space exploration
- Correlation analysis
- Different viewpoints

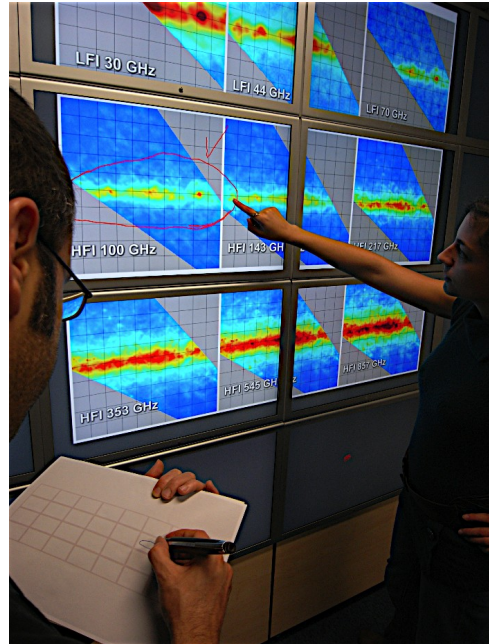
... where the
views of
many objects
are important

- Collaborative aspects
- Multidisciplinary analysis
- Trade-offs
- Decision making
- Man-in-the-loop ...

Consider visualization facilities as an added-value scientific tool ...

... where the
number of
pixels is
important

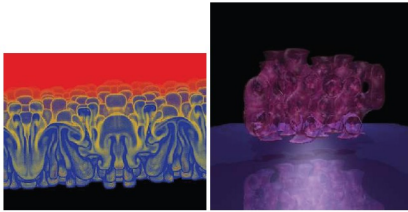
- Scientific discovery in large volume of data



WILD wall (LRI)



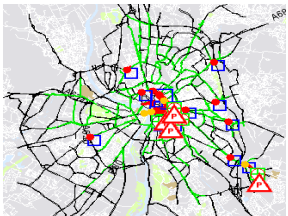
Consider visualization facilities as an added-value scientific tool ...



Volume exploration
(LANL / TRex)



Multisurface
interaction / WILD



Graphical queries,
Drill-down / roll-up
<http://claire-siti.inrets.fr>

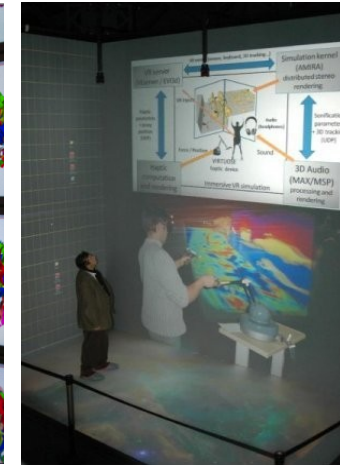


... where
high-end **user
interfaces** are
important

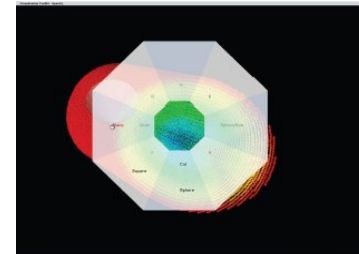
- 3D
- Intuitive
exploration



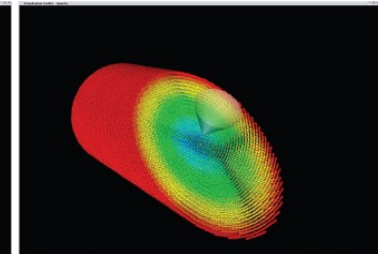
Specific
user-interfaces



Haptic systems
EVE, CNRS/LIMSI



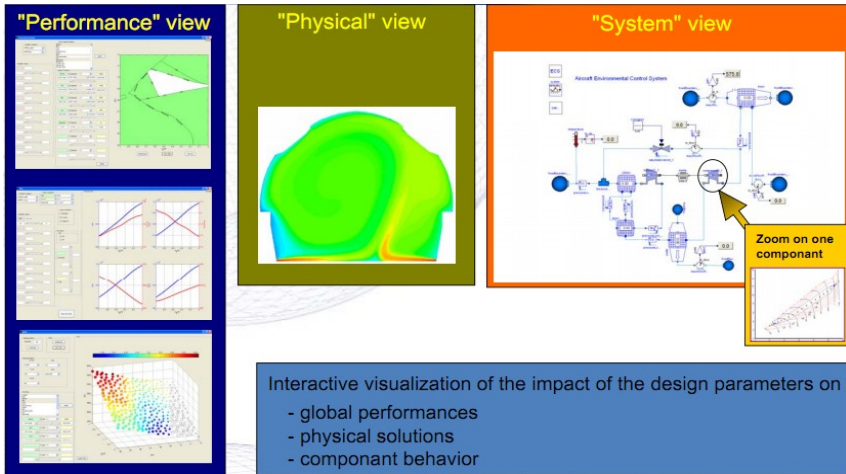
3D FlowMenu
S. Latapie PhD,
CEA DAM/DIF
ECP



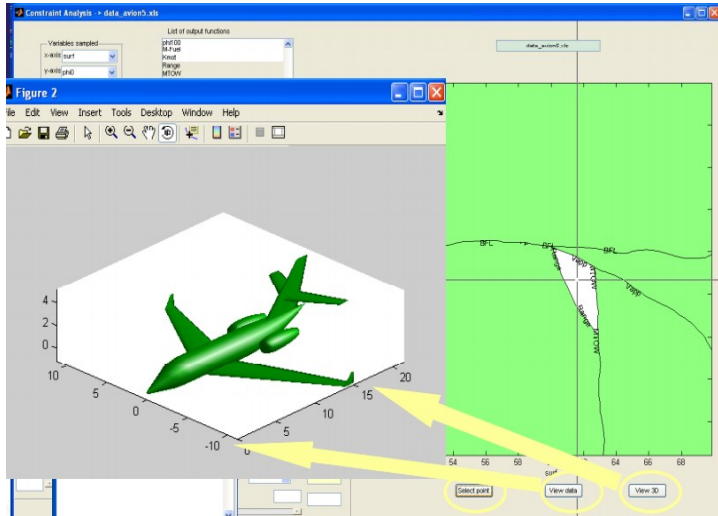
CEA List



Consider visualization facilities as an added-value scientific tool ...

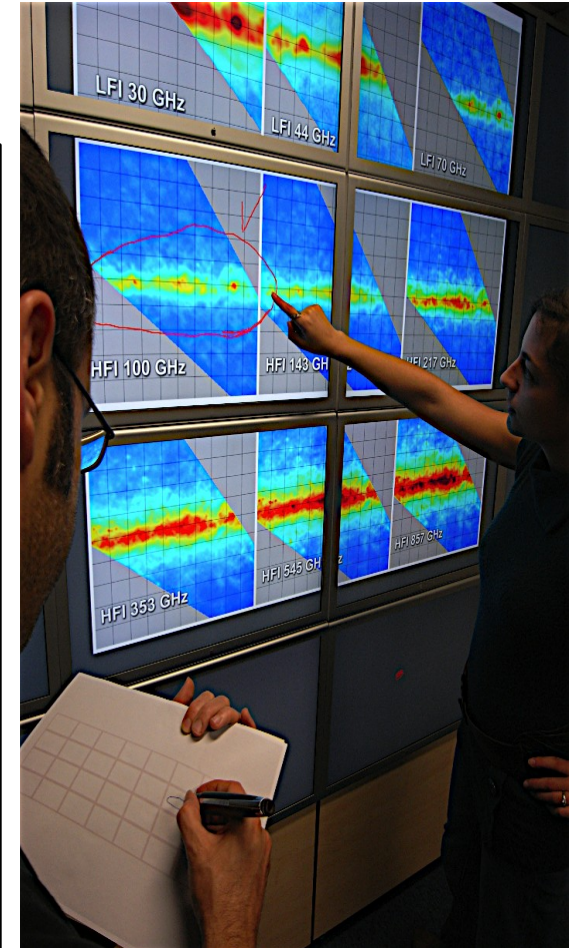


M. Ravachol – CSDL Project



... where
multiple
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are important

- High-dimensional space exploration
- Correlation analysis
- Different viewpoints



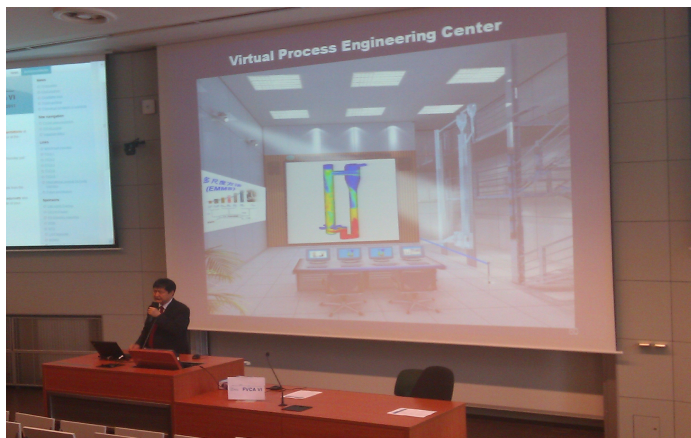
Consider visualization facilities as an added-value scientific tool ...



Planning exploration mission at the NASA JPL



Pr. D. Mavris
CoVE
ASDL, GeorgiaTech



Pr. J. Li (FVCA6 conf.)
Institute of Process Eng. IPE
Chinese Academy of Science

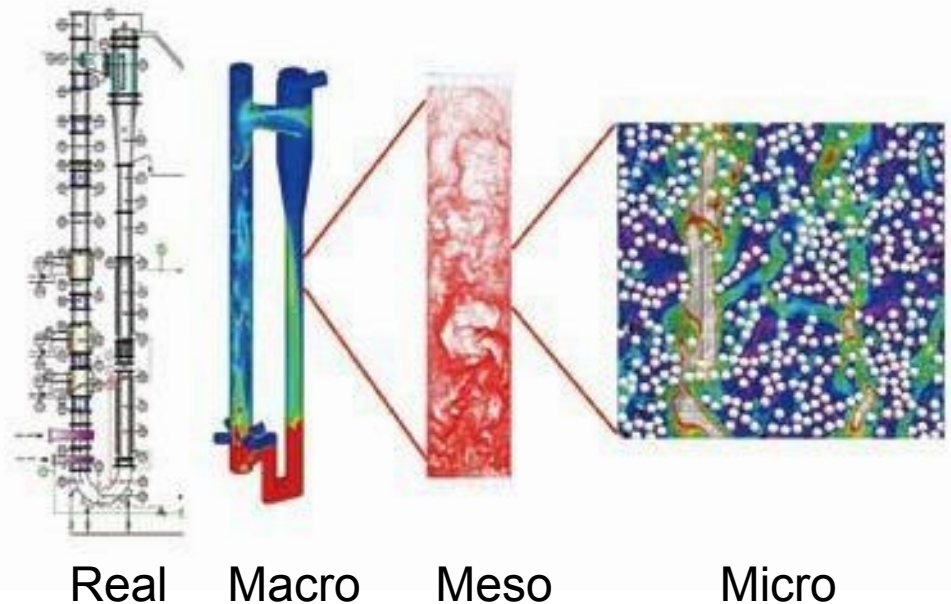
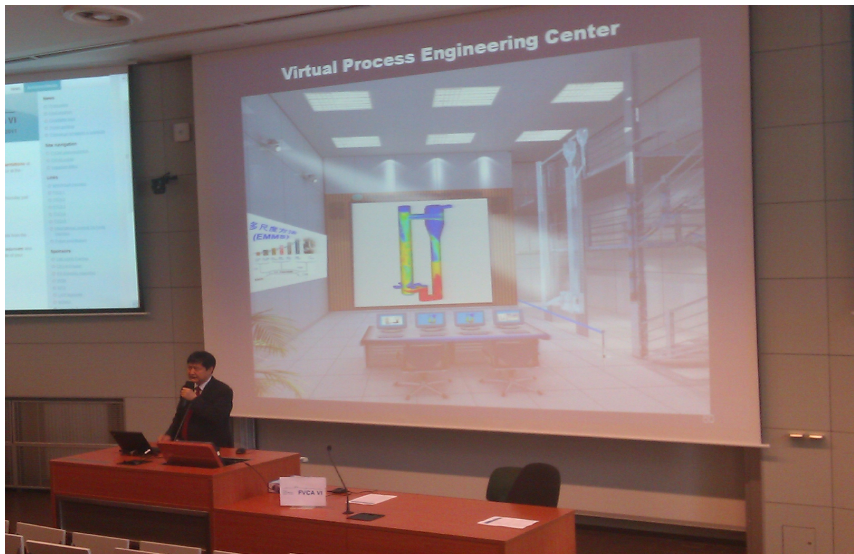
Multiscale Multiphase flow simulation

... where the views of **many objects** are important

- Collaborative aspects
- Multidisciplinary analysis
- Trade-offs
- Decision making
- Man-in-the-loop
- Choice of designs ...

Ex: Multiscale simulation of multi-phase complex systems

Fluid Catalytic Cracking (FCC) application



© Institute of Process Engineering

Many scales

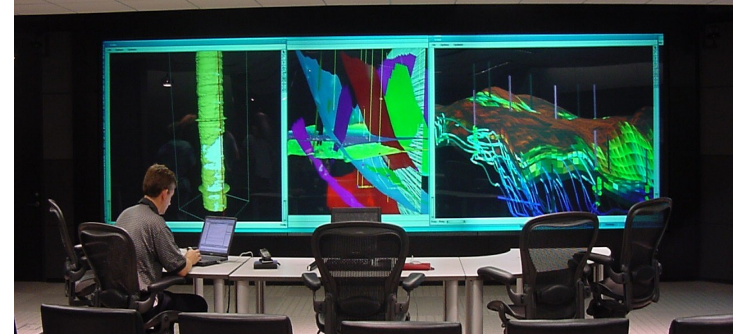
Institute of Process Engineering, Chinese Academy of Science
State Key Laboratory of Multi-Phase Complex Systems

Research activities at ENS Cachan

- « Fair » visualization of massive simulation datasets (collaboration with CEA DAM DIF)
- Real time simulation on GPU + Viz (R. Bennacer, A. Caignot, F. De Vuyst, L. Desvilletes, J.M. Ghidaglia, C. Labourdette, C. Rey – *nVIDIA* Equipment GRANT support)
- Reduced-order modeling of datasets for fast remote visualization and exploration
- Use of Parallel-in-time algorithms for online visualization of time-dependent simulations datasets

ENS Cachan Equipment:

- Large data wall 6m x 2.20m
3360x1200 pixels



- 2 QuadHD monitors, 8 Mpixels



56"

... hosted at the Farman building, dedicated to multi-disciplinary projects and interaction between different labs (Farman institute www.farman.ens-cachan.fr).

Thank you for your attention

