

VAHINE

Visualization and analysis of multi-dimensional hyperspectral images

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<http://mistis.inrialpes.fr/vahine/dokuwiki-2008-05-05>

Vahine partnership



This project would not be possible without the financial support of :



through its MDCO program (“Masse de Données et COnnaissances”). The Vahiné project was selected in 2007 under the reference ANR-07-MDCO-013.



through its “R&T Systèmes Orbitaux” program.

- Astrophysical investigations with visible and near infrared imaging spectroscopy.
- New data “hypercubes” (big size ~500Mo and 4D)
- New algorithms for statistical and physical analysis
- Developing physical and mathematical models, algorithms, and software able to deal with the hyperspectral dataset

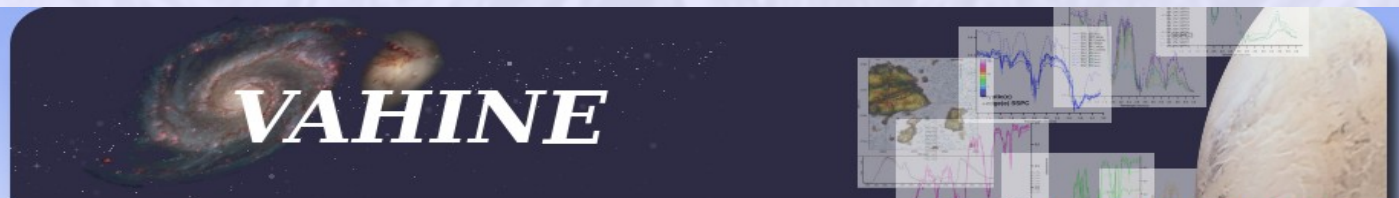
- Project divide in four workpackages :
 - Statistical image processing
 - Mathematical and physical models
 - Inversion algorithms
 - Visualization system

- Data access (Internet access)
- Data manipulation, visualization and analyses
- Using algorithms with custom workflow

- At this moment we have :
 - Several tera-bytes of data
 - One xls file for searching data
 - Format data is Planetary Data System
 - Several Matlab algorithms
 - We use Envi for visualization

- =>New software application required

Vahine Web Service for the data access



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Data Search

Recherche sur OMEGA

Vous pouvez ajouter ou supprimer (🗑️) un champ de recherche et pour chaque champ ajouter (📏) ou supprimer (✖️) un filtre

LS

LS (float)

Filtre 1

min lat (float)

Filtre 1

max lat (float)

Filtre 1

Le nombre de résultat est volontai

Data Search

Listes des champs associé aux modèles

Modèles :

Nom	Parent	Description	Accès
OMEGA		data OMEGA	VAHINE_EXTERNAL

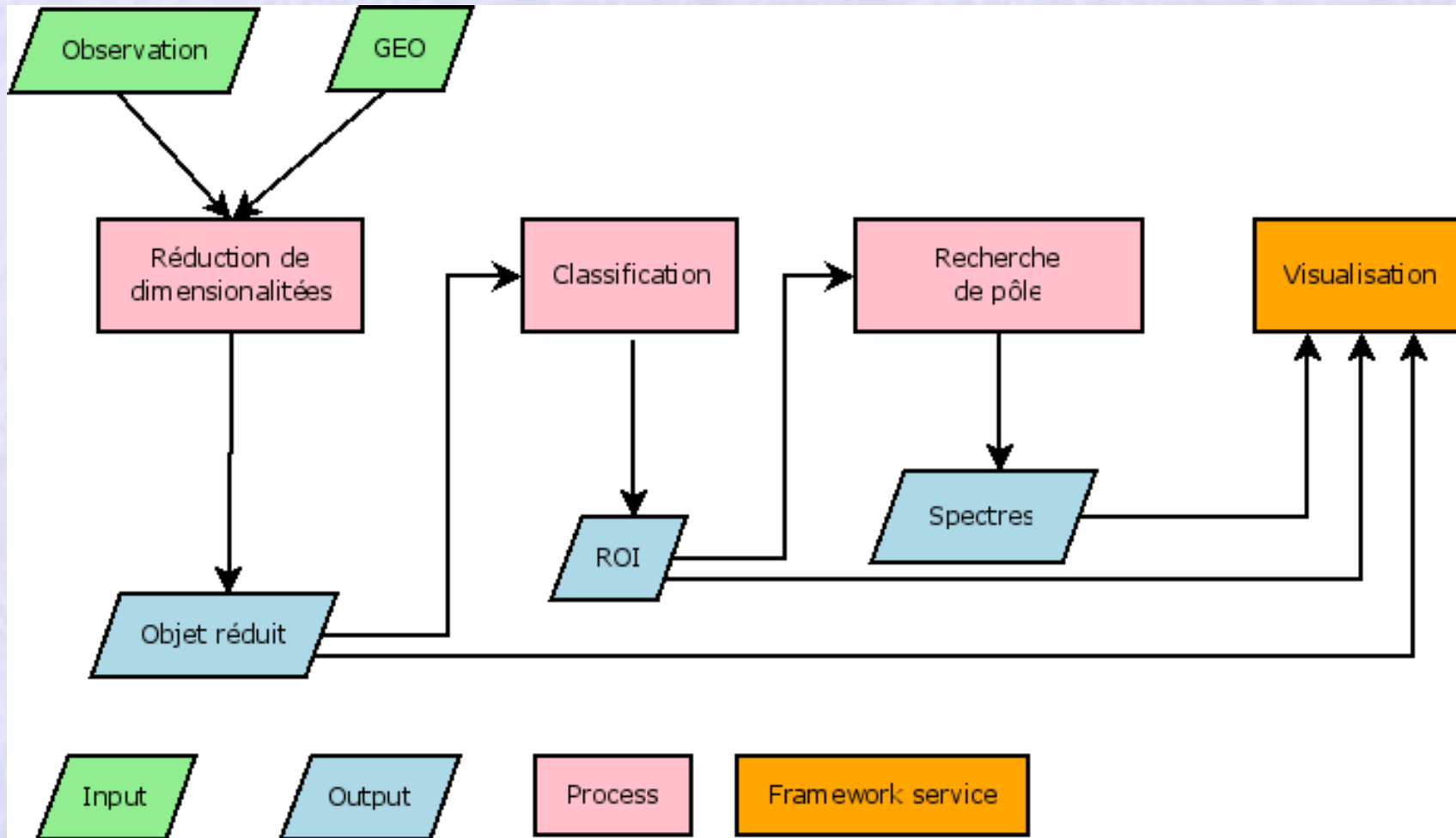
Champs associé au modèle de donnée OMEGA :

	Inclus	Nom	Description	Type	PDS	Majeur	Accès
<input type="checkbox"/>	<input checked="" type="checkbox"/>	LS	solar longitude	FLOAT		<input checked="" type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	min lat	minimum latitude	FLOAT		<input checked="" type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	max lat	maximum latitude	FLOAT		<input checked="" type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	day start	start day of measure	DATE		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	start time	start measure time	DATETIME		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	stop time	stop measure time	DATETIME		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	east long	east longitude	FLOAT		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	west long	west longitude	FLOAT		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	nb cols	number of columns	INTEGER		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	nb line	number of lines	INTEGER		<input type="checkbox"/>	VAHINE_EXTERNAL
<input type="checkbox"/>	<input checked="" type="checkbox"/>	%Prop CO2		FLOAT		<input type="checkbox"/>	VAHINE_CORE
<input type="checkbox"/>	<input checked="" type="checkbox"/>	%Prop CO2_rb		FLOAT		<input type="checkbox"/>	VAHINE_CORE
<input type="checkbox"/>	<input checked="" type="checkbox"/>	%Prop H2O		FLOAT		<input type="checkbox"/>	VAHINE_CORE
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<input type="checkbox"/>	<input checked="" type="checkbox"/>	%Prop Unknow_rb		FLOAT		<input type="checkbox"/>	VAHINE_CORE



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By Edgewall Software.

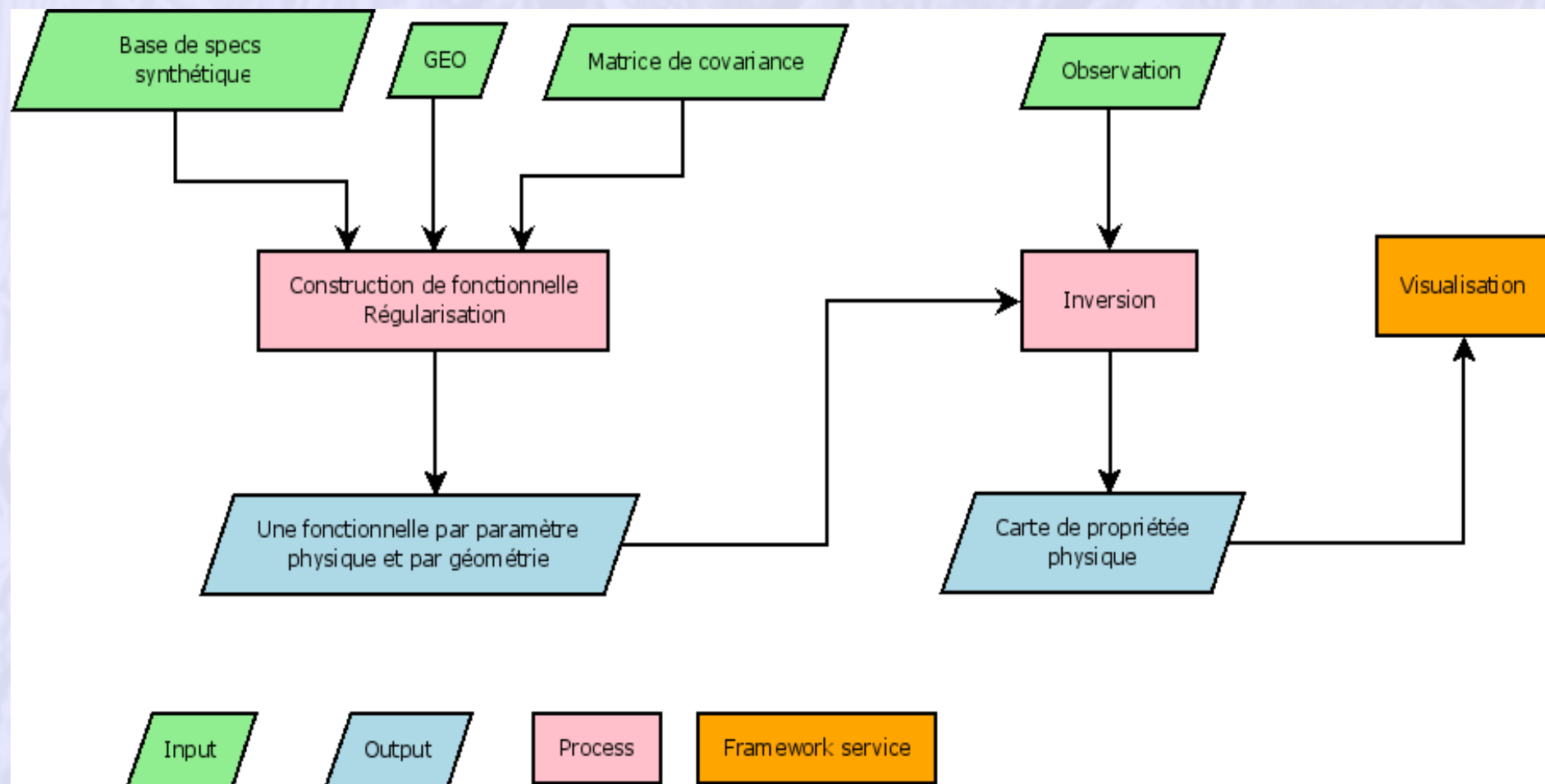
Vahine : typical classification workflow



Each process :

- requires input parameters and tuning
- generates technical as well as scientific logs

Vahine : typical Inversion workflow



Vahine Framework Requirements

- Currently project requirements for software :
 - Human machine interface for controlling processes and data manipulations
 - Informative visualization of data (efficient, fast)
 - Add or remove algorithms for each run
 - Intermediate results between each algorithm
 - Possible grid calculation
 - Easily create custom workflow
 - “Use or do not used” VO normalization ?
 - Scientific tests of algorithms in a systematic manner

Software and Algorithms testing & development

“Write the right code” “write the code right”

- For software code (Industrial method of development)
 - Unit tests (check one function) “code right”
 - Acceptance tests (check one functionality) “right code”
- For algorithms ?
 - Manual test is not satisfying !
 - Create acceptance tests for scientific algorithms ?
 - Which measures for automated test with several ten data set ?
- Scientific framework : what is the best one for us ?