CLASYCO (Conception de Langages dédiés au domaine des SYstèmes Complexes)

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- **Main objective of the network** Federate an emergent community of researchers/modelers using **domain-specific languages** for complex systems

- 2012 - Supported and funded by RNSC

- 15 researchers joined the network (CIRAD, CNRS, IRD, ...)

- http://clasyco.spatial-computing.org/

Domain-Specific Languages

- A **domain-specific language** (DSL) is a programming or modeling language that offers through appropriate notations and abstractions, expressive power focused on, and usually restricted to a particular problem domain.

- **Benefits:** Close to the knowledge and know-how of domain experts, Expressivity gains, Ease the communication between CS experts and domain-experts, ...

- DSL for complex systems should allow the description of **dynamic spatialized entities** by using/coupling several notations: ordinary differential equations (ODE), partial differential equations (PDE), agent-based approaches, stochastic processes, graph modeling, state machines, ...

Long-term Research Questions

- Is complex system a domain ? Provide the right meta-concepts for complex systems

- How to combine several modeling languages (or notations) at the same time ?

- How to describe multi-scale phenomena (in time and space) ?

- How to capture in a language, hybrid continuous/discrete models ?

Existing DSLs developed by the network

GAMA/GAML (IRD)	Agent-based simulation	Spatial model of forest growth, propagation of Brown Plant Hopper in rice fields, H1N5 in vietnamese village
MGS (U-PEC, CNRS)	Graph transformations	System Biology, developmental biology, amorphous computing
OCELET (CIRAD)	Dynamic interaction graph	Coastal dynamic of mangrove ecosystems, land cover changes in agroforestry zone, rift valley fever
OpenAlea (CIRAD, INRIA)	Visual component-based approach	Plants modeling: plants architecture&geometry, environment modeling (light, rain, ...)

2012 CLASYCO's Planned activities

- Web site (publications, participants, existing platforms, ...) & mailing-list

- 2 meetings in France (July 4, autumn)

- International workshop colocated with another conference on complex systems (ICCS 2012 or ECCS 2012)

4 July Meeting

- **Introduction to DSL for Complex Systems** (Serge Stinckwich/IRD)

- **Kendrick, a DSL for Epidemiological models**, (Serge Stinckwich/IRD, Mikal Ziane/LIP6)

- **MGS, un langage dédié pour la modélisation et la simulation de systèmes dynamiques à structures dynamiques** (Antoine Spicher/UPEC, Jean-Louis Giavatto/IRCAM, Olivier Michel/UPEC)

- **OpenMole, a DSL to explore complex system models** (Romain Reuillon/ISCPIF)

- **Modélisons la mobilité en toute simplicité** (Christophe Lang/Univ. Franche-Comté, Nicolas Marilleau/IRD)