Generalisation Research COGIT Lab

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Lecordix Francois
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Bard Sylvain
Barillot Xavier
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An Overview on the COGIT research on generalisation 1992-2001

Anne Ruas

Director of the COGIT Laboratory

PhD on Strategies of Generalisation

IGN France (French NMA) context

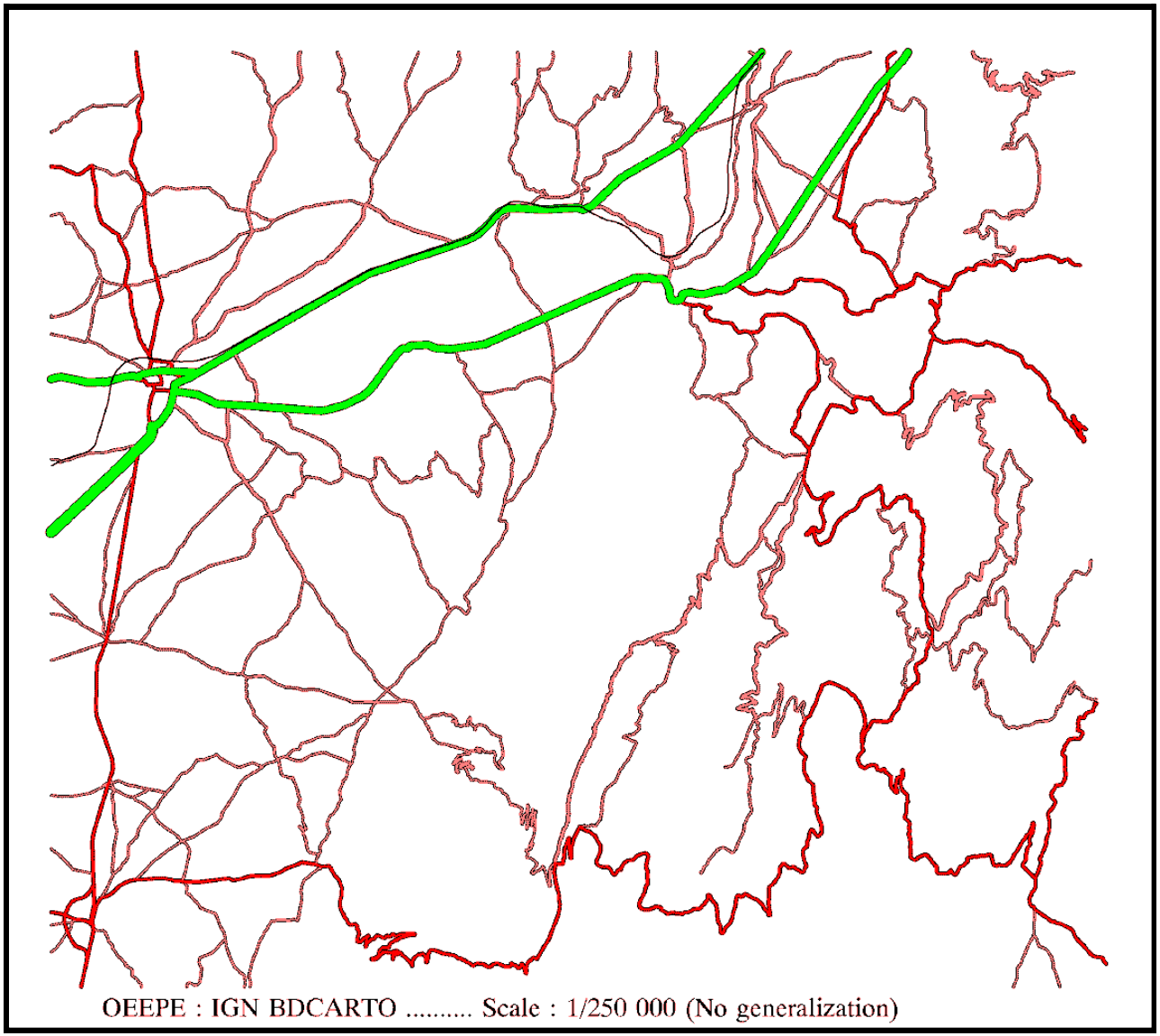
COGIT in Numbers

- **20 people (high turn over):**
  - **4 doctors, 1 post doc**
  - **4 ingeniors (3 research/study, 1 computer)**
  - **11 phD students**
- **~ 8 non phD students / year**
- **~ 500 training course hours / year**
  - **1/2 GIS ; 1/2 computer-statistic**
- **Participation to European projects**
  - **1998-2000 : the Agent project**
  - **2000-2002 : The MurMur Project**

COGIT Research

• Generalisation	since 92
• Data bases updating & Matching	since 92
• 3D	since 97
• Data bases access	since 98
• Data bases unification	since 00
• Risk management	since 00
• Name placement	94-97
• Data Quality	92-98

IGN BDCarto: e.g. the Roads



IGN BD Topo

Research on Generalisation

- **1992**: beginning of the research
  - 'state of the art' A. Ruas JP Lagrange
    - What are the problems ? The solutions?
  - 3 areas of research:
    - road generalisation (From IGN BDCarto)
    - urban generalisation (From IGN BDTopo)
    - DTM Generalisation (From IGN BDAlti)

- Analysis on
  - Data Modelling
  - GIS : on which prototype ??

1993-94

- Organisation of **Compiegne meeting** (JP Lagrange)
  - ➨ 'GIS and Generalisation'
- Creation of the **OEEPE Working Group on Generalisation** managed by
  - Jean-Philippe Lagrange (93-95)
  - Anne Ruas (96-00)
- 93-95 : **conception of 2 GIS prototypes**
  - PlaGe for Road Generalisation (Francois Lecordix)
    - Development of well known algorithms (Douglas, Thapa, Wall Danielson, Lang, Gauss, Lowe, Nickerson) and COGIT enrichment
  - Stratège (OO, ES) for Urban Generalisation (Anne Ruas)

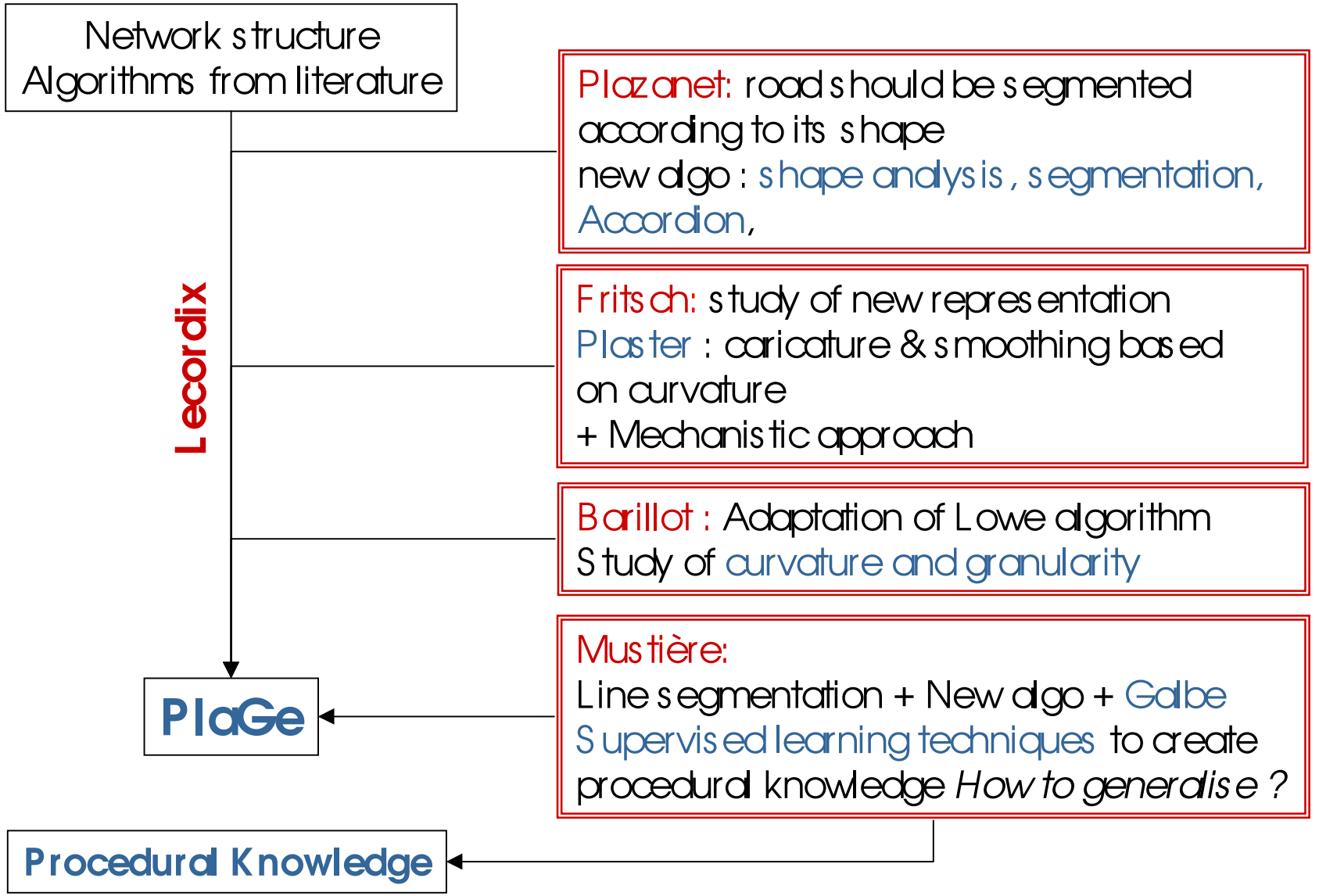
PhD Thesis : 93-95

- 93
  - Corinne Plazanet (PlaGe)
    - Line shape analysis for generalisation
  - Pascale Monier (IGN Library)
    - Relief Analysis for generalisation
- 94
  - Nicolas Regnauld (Stratège)
    - Building typification
  - Jean-Francois Hangouët (Stratège)
    - Voronoi diagram for generalisation
- 95
  - Emmanuel Fritsch (PlaGe)
    - Line generalisation algorithms based on new representation (Plaster)
  - Anne Ruas (Stratège)
    - Strategies of generalisation

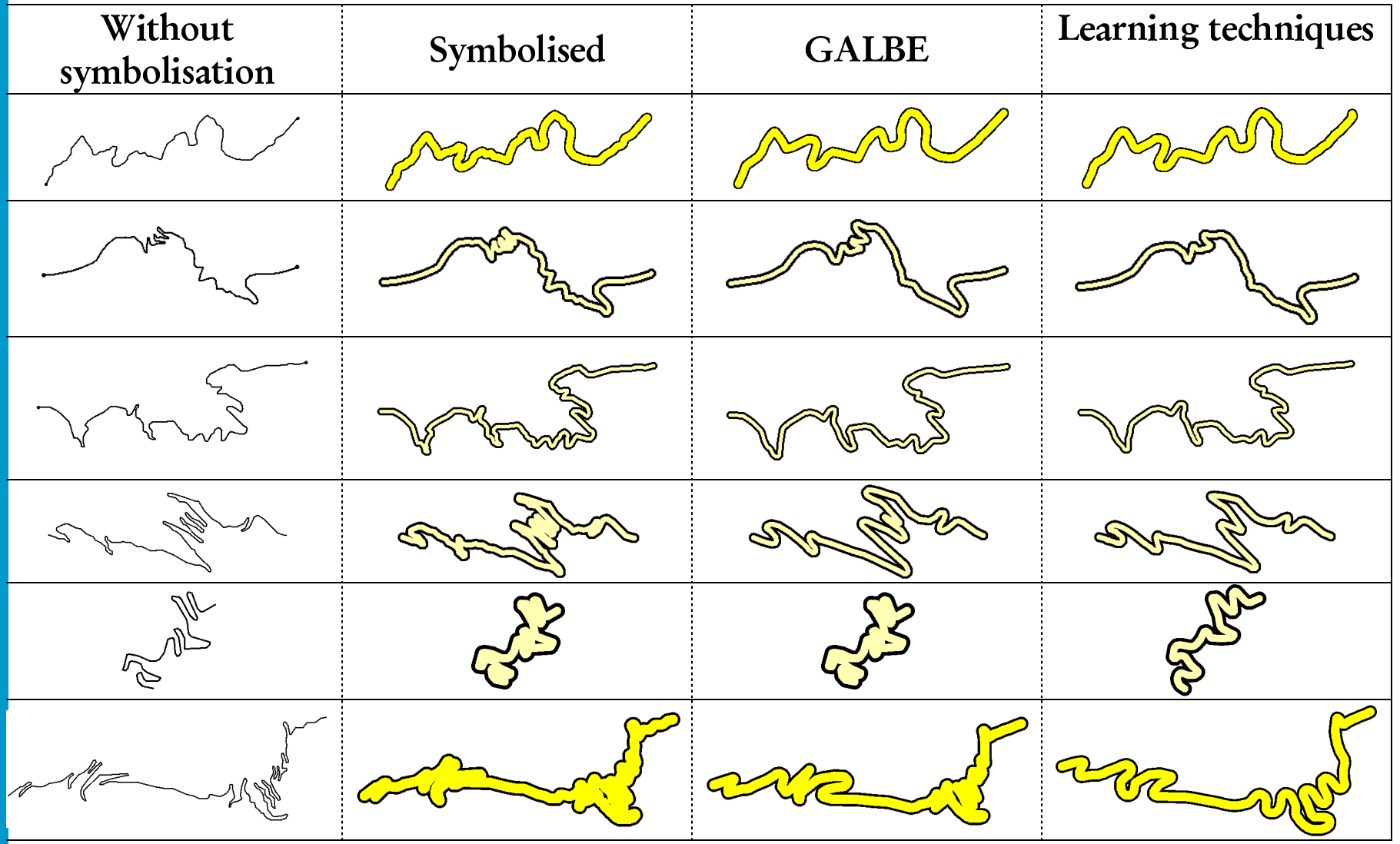
PhD Thesis : 97-00

- 97
  - Sébastien Mustière (PlaGe + Learning Algo)
    - Supervised learning techniques for generalisation
- 98
  - Annabelle Boffet (Lamps2) *ACI Presentation*
    - Town analysis for urban generalisation
- 00
  - Cécile Duchêne (Lamps2-Agent)
    - Negotiation mechanism for generalisation
  - Sylvain Bard (Lamps2-Agent)
    - Evaluation of generalised data
- + ~25 non phD students [2-6 months]

Road Generalisation

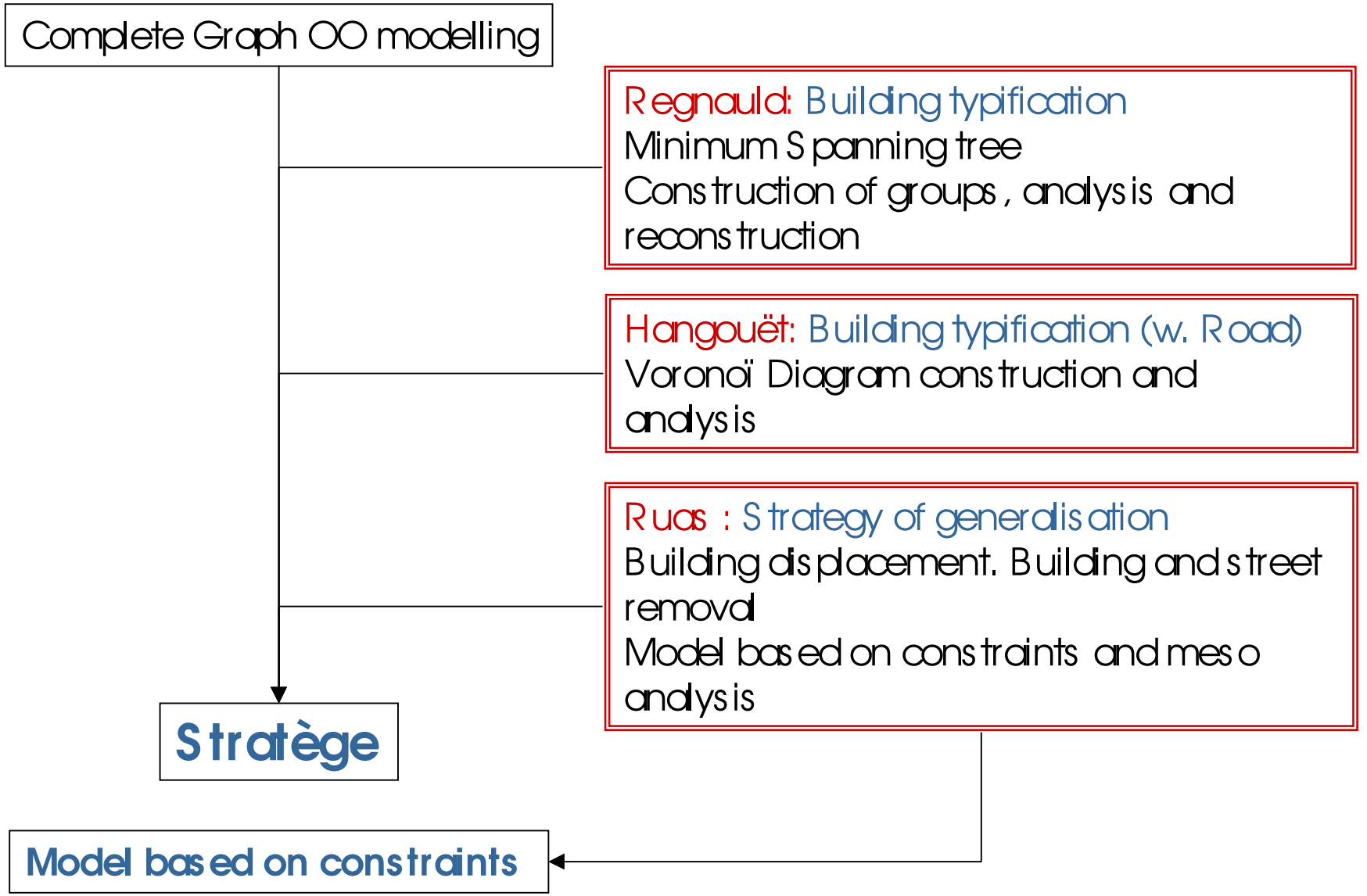


Some results

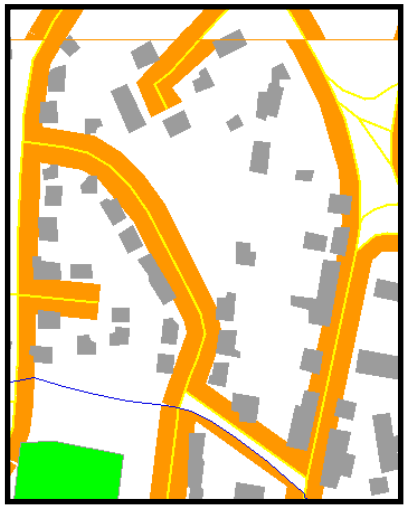


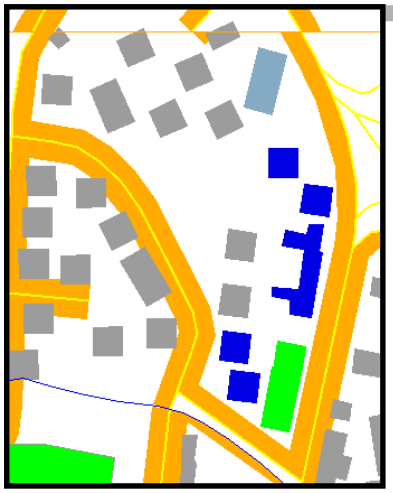
[Mustière 2001 p 161-162]

Urban Generalisation

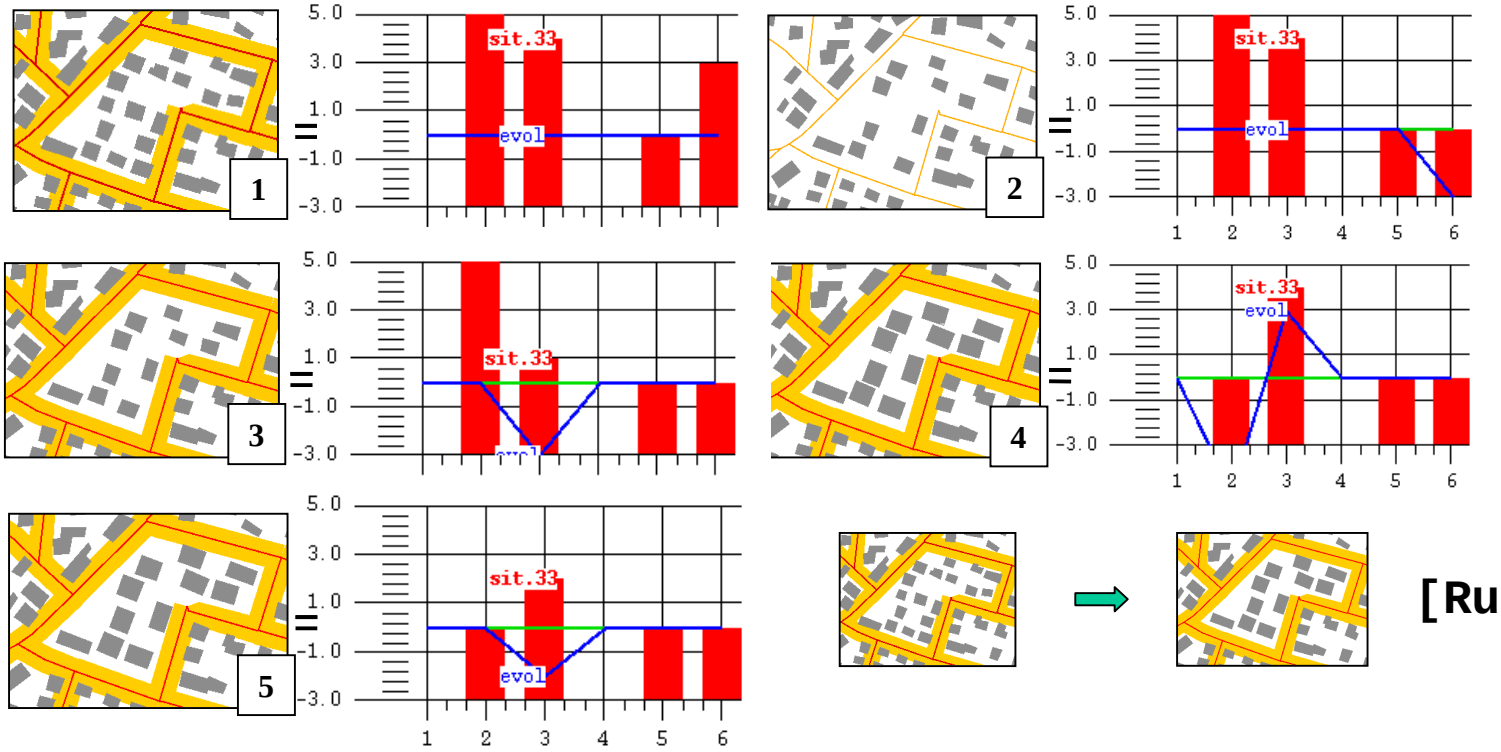


Some results





[Regnauld]



[Ruas]

The AGENT Project 98-00

COGIT : Leader of the project
Sylvie Lamy,
Anne Ruas,
Cécile Duchêne..

Uni. Zurich
Robert Weibel,
Mathieu Barrault,
Geof. Dutton,
Mats Bader

Uni. Edinburgh
William Mackaness,
Nicolas Regnauld,
Alistair Edwards

Generalisation

SIG OODB

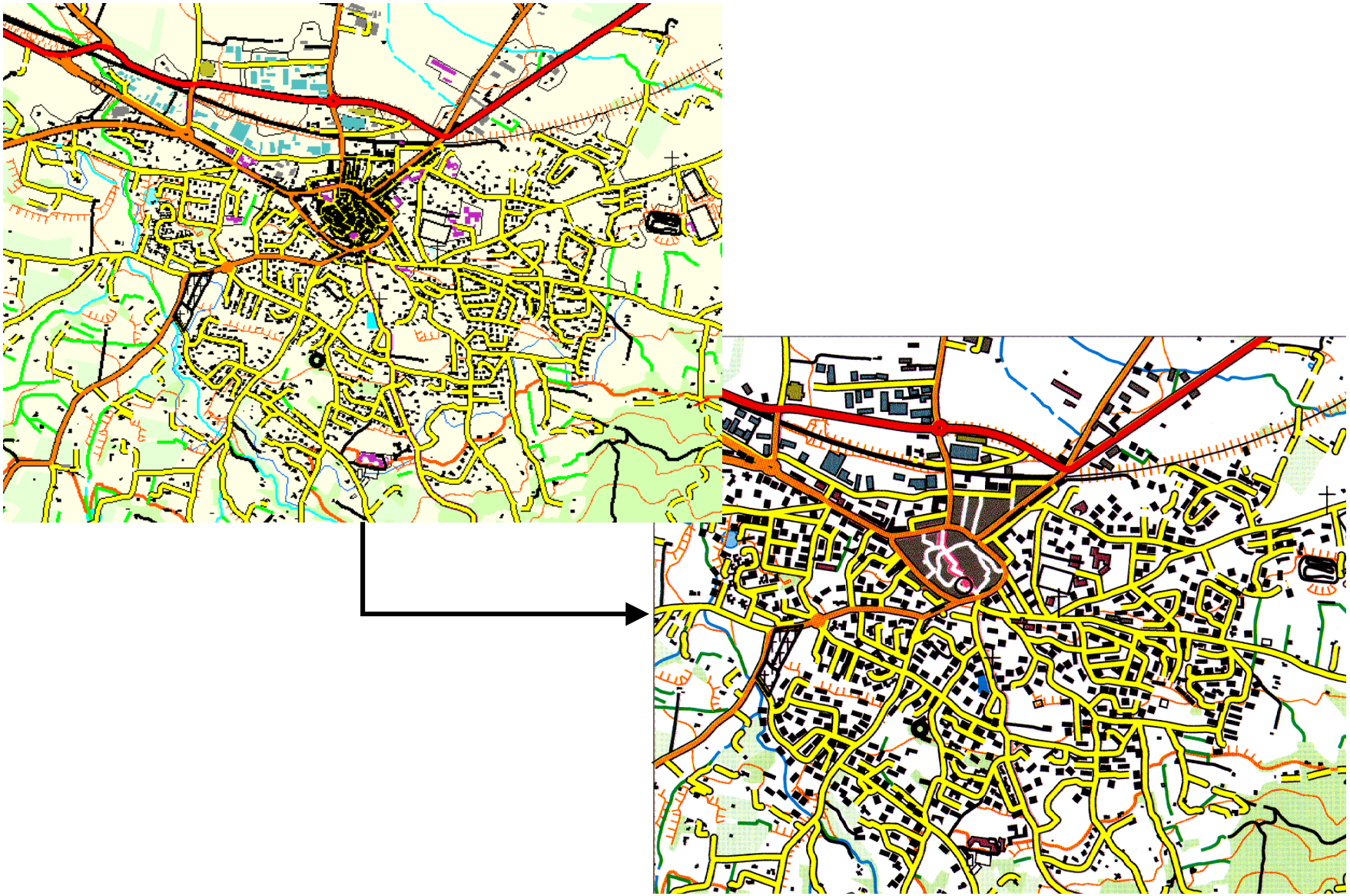
Laser-Scan
Mike Jackson,
Paul Hardy,
Kelvin Haire,
Richard Horn

AGENT

Agent

INPG
Yves Demazeau,
Christof Baeijs

Some results of AGENT



OEEPE WG on Generalisation

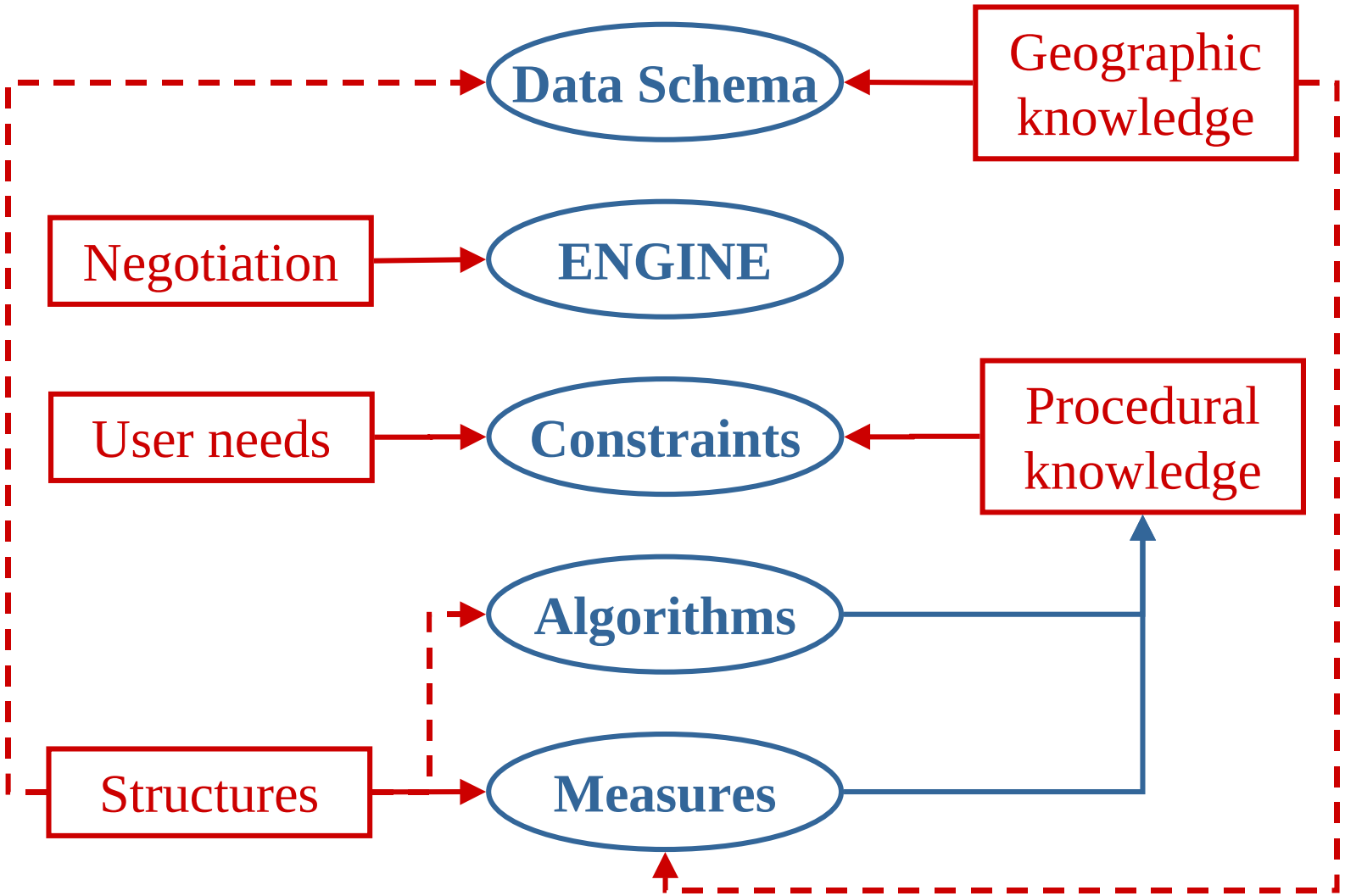
- 94-95 test of generalisation packages
  - MGE/MG; CHANGE (ICC; Zurich; COGIT)
- 96-97
  - normalised description of some algorithms
- 97-00 test on process of generalisation:
  - 3 resolution; 5 packages
    - Lamps 2; MGE; Change; PlaGe; Strategе
  - final report: OEEPE Official publication N°39
    - "Automatic generalisation project : Learning process from interactive generalisation"
    - http://www.oeepe.org

The future

- **2002**
  - **Integration of research on Town analysis** ***Annabelle Boffet***
  - **Use of learning based techniques** ***Sebastien Mustière***

- **Two new pHD**
  - **Cécile Duchêne : improvement of Agent behaviour for heterogeneous areas**
  - **Sylvain Bard : evaluation of generalised data**

Synthesis


Data Schema
Geographic knowledge
Negotiation
ENGINE
User needs
Constraints
Procedural knowledge
Algorithms
Structures
Measures