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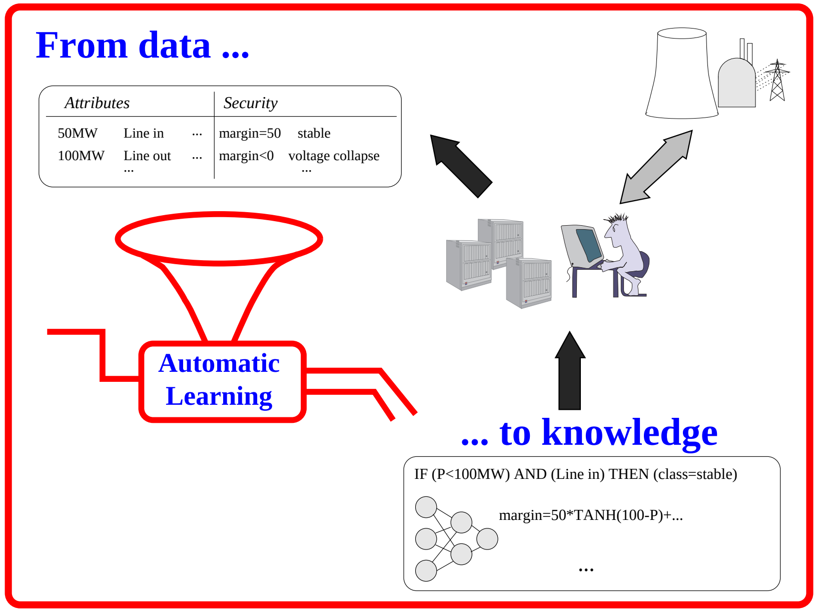
Visualizing Dynamic Power System Scenarios for Data Mining

Pierre GEURTS and Louis WEHENKEL
University of Liège - Belgium

I. Data mining in power systems
II. Dynamic security information data bases
III. Generic visualization techniques
IV. Specific visualization techniques
V. Overview of software architecture

Copies of the slides can be downloaded from the Web at `http://www.montefiore.ulg.ac.be/~lwh/`



I. Data mining in power systems

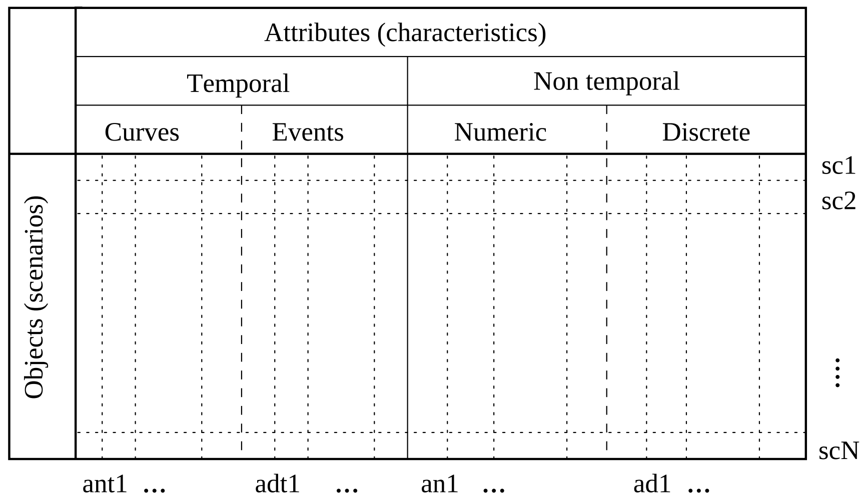
Data mining ?

- Aims at extracting useful (and novel) information from data bases
- Uses statistical techniques, machine learning, data base technology
- Provides interactive visualization tools to support data mining

Sources of data in power systems ?

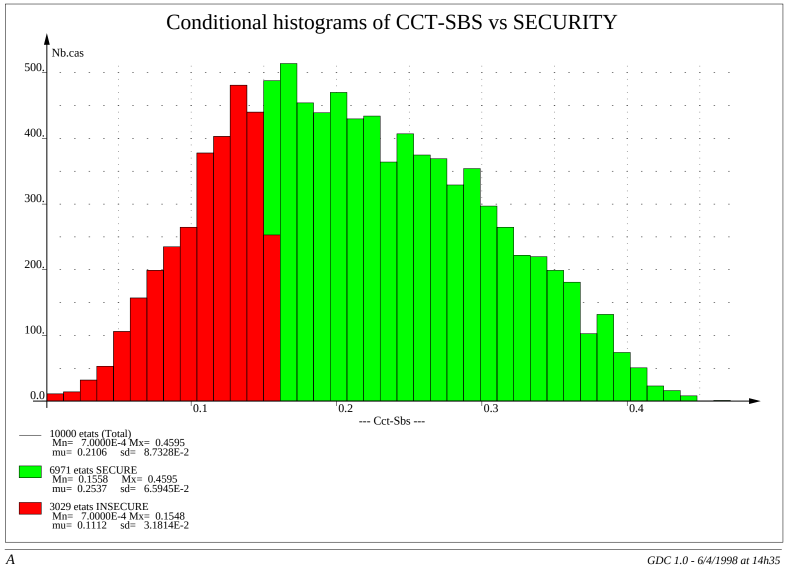
- Field records and measurements
- Centralized data archives
- Data generated by simulations

II. Dynamic security information data bases

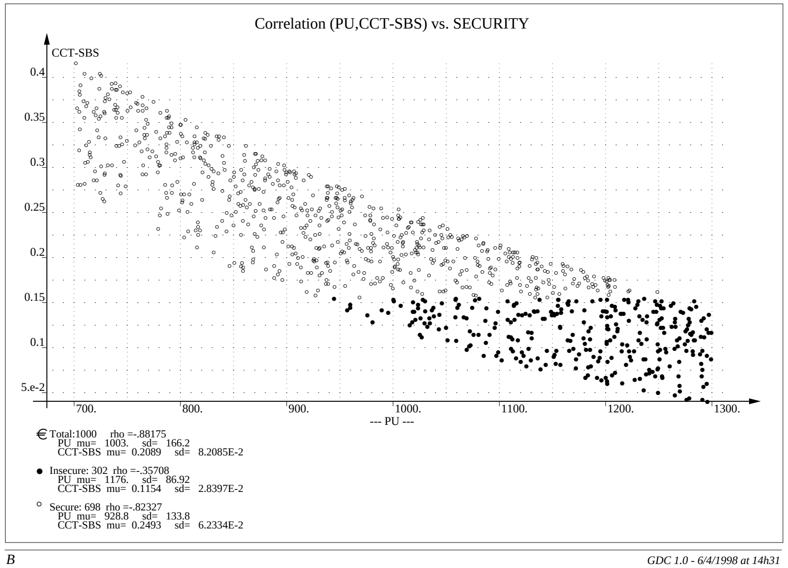


(3rd dimension : time)

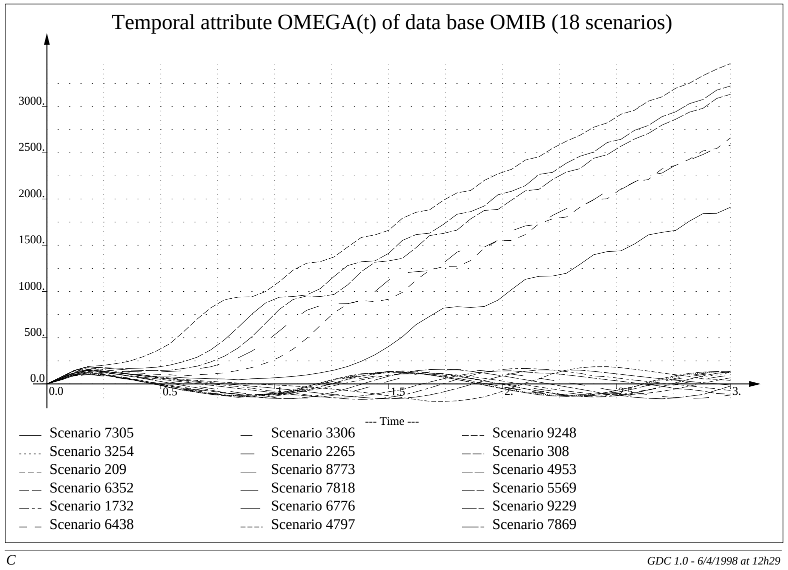
III. Generic visualization techniques



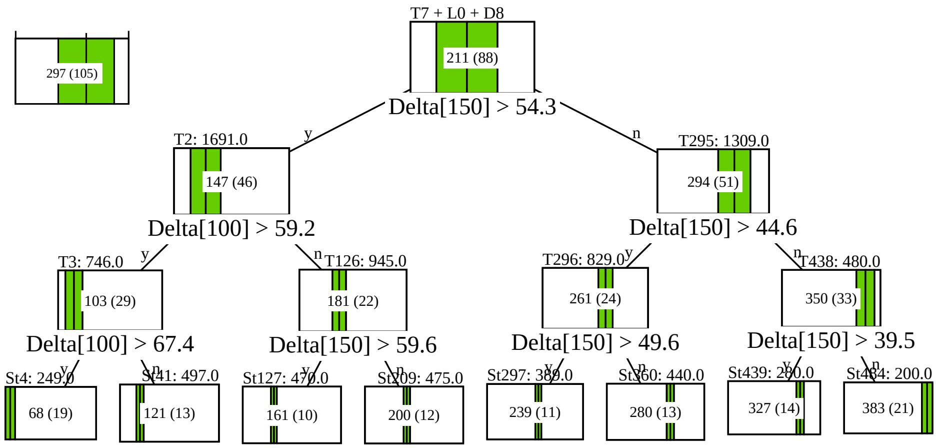
III. Generic visualization techniques (cont'd)



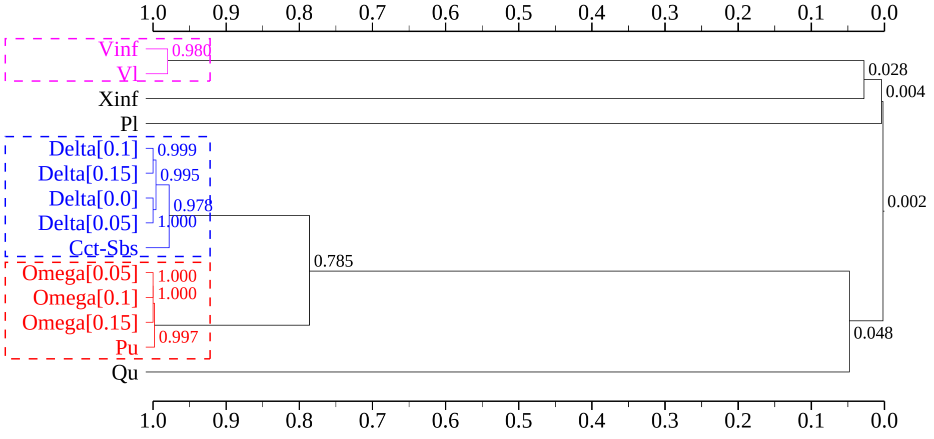
III. Generic visualization techniques (cont'd)



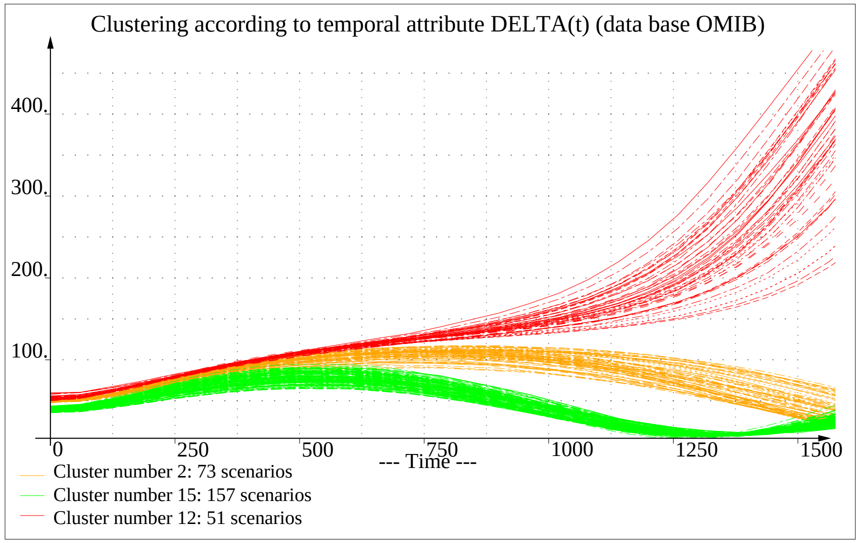
III. Generic visualization techniques (cont'd)

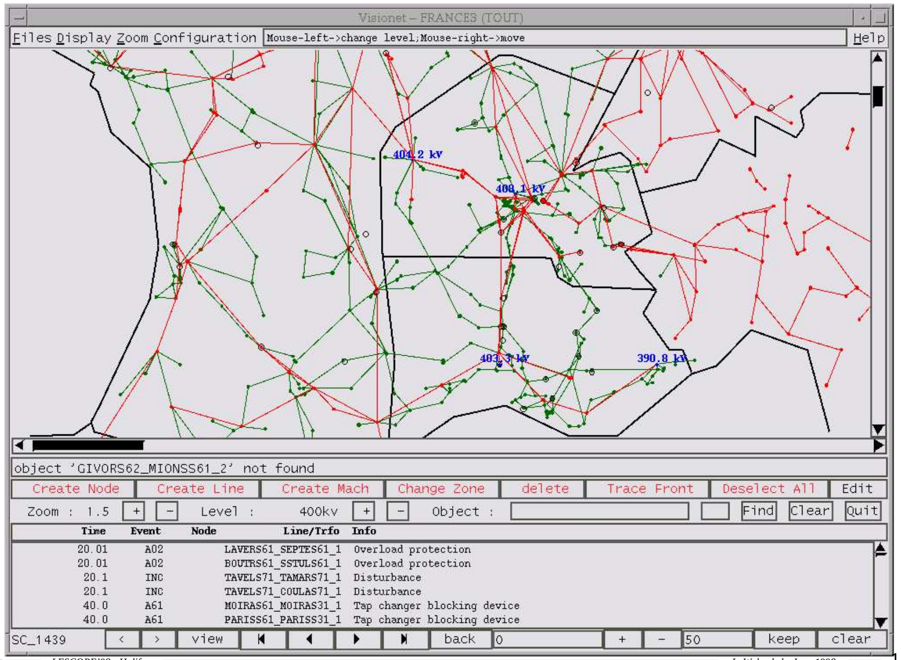


III. Generic visualization techniques (cont'd)

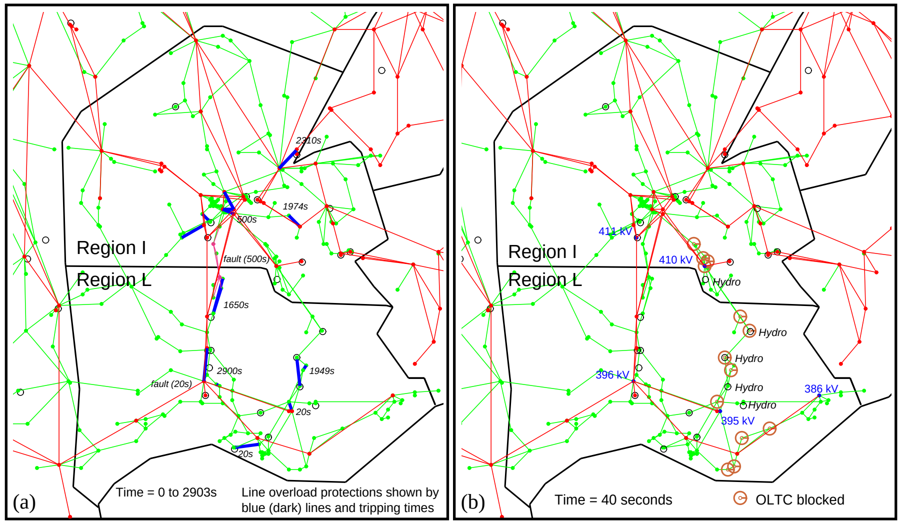


III. Generic visualization techniques (cont'd)

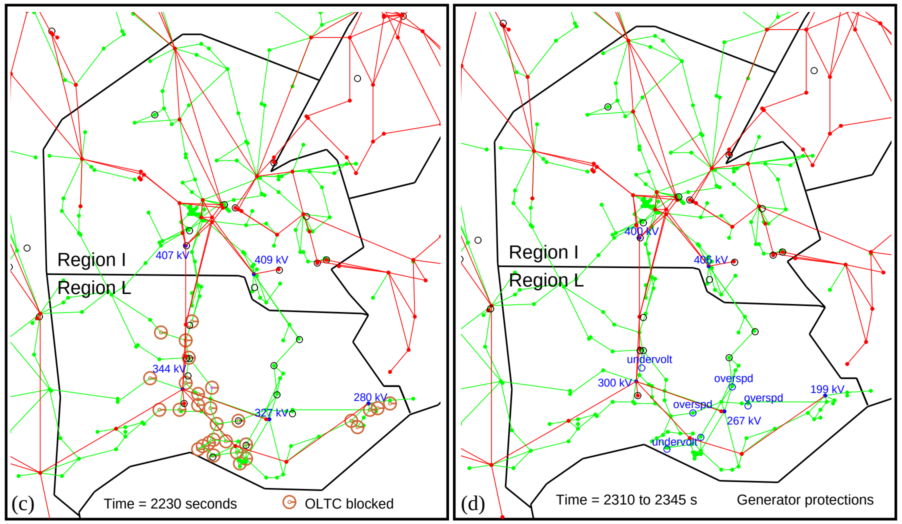


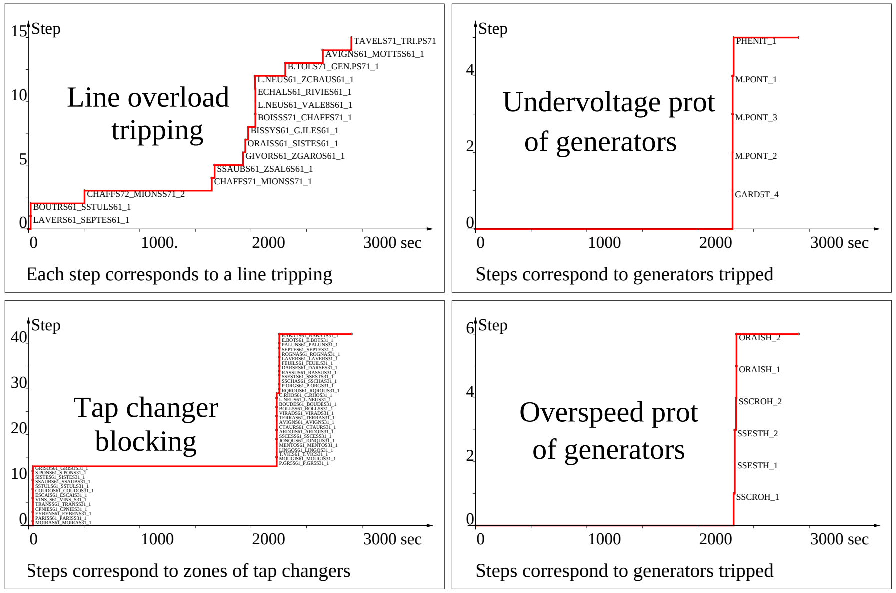


IV. Visualization of events and attribute values



IV. Visualization of events and attribute values (cont'd)



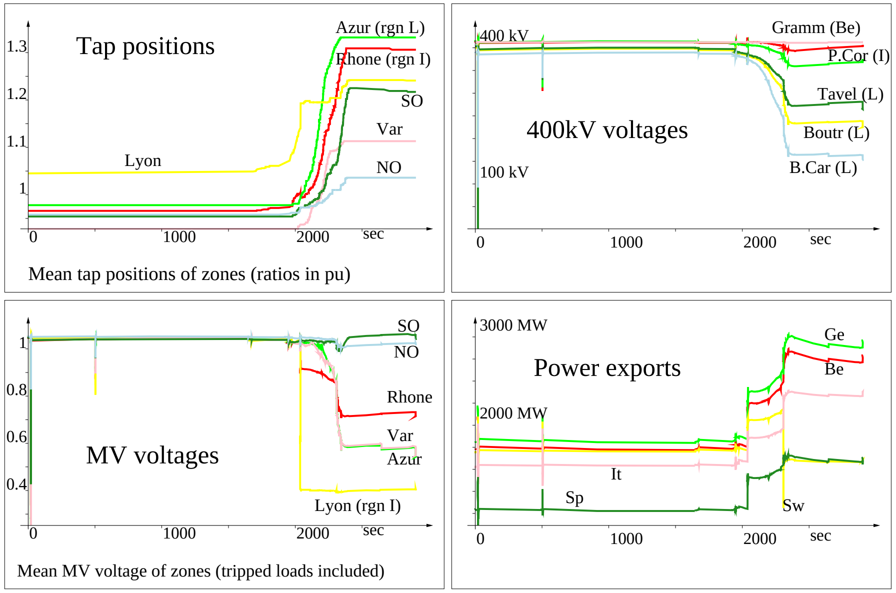


Each step corresponds to a line tripping

Steps correspond to generators tripped

Steps correspond to zones of tap changers

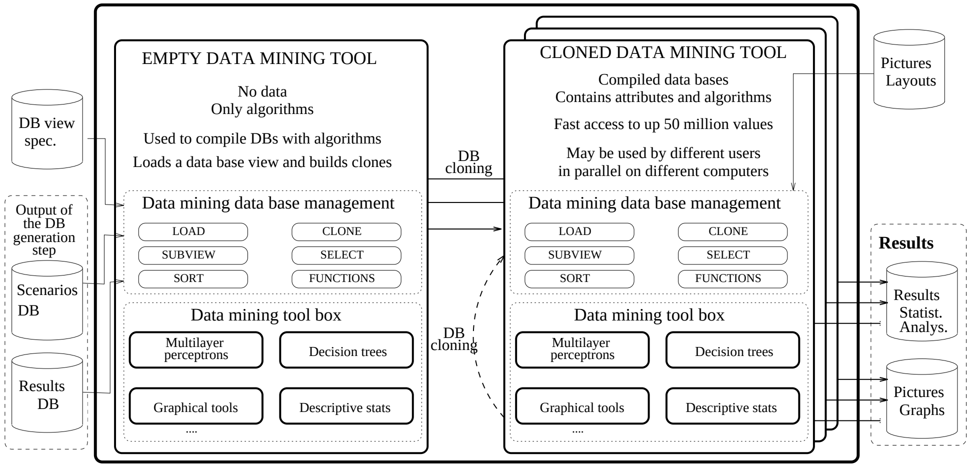
Steps correspond to generators tripped



Mean tap positions of zones (ratios in pu)

Mean MV voltage of zones (tripped loads included)

V. Software architecture : data mining software



Coupling of visualization tool and data mining software