



Context

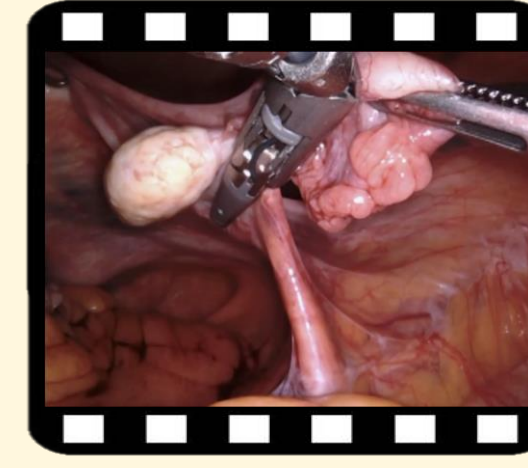
Surgery is a highly complex entity to understand



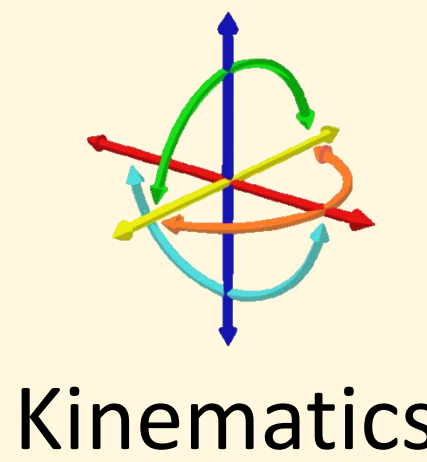
yet multiple sources of variability

Data acquisition and annotation

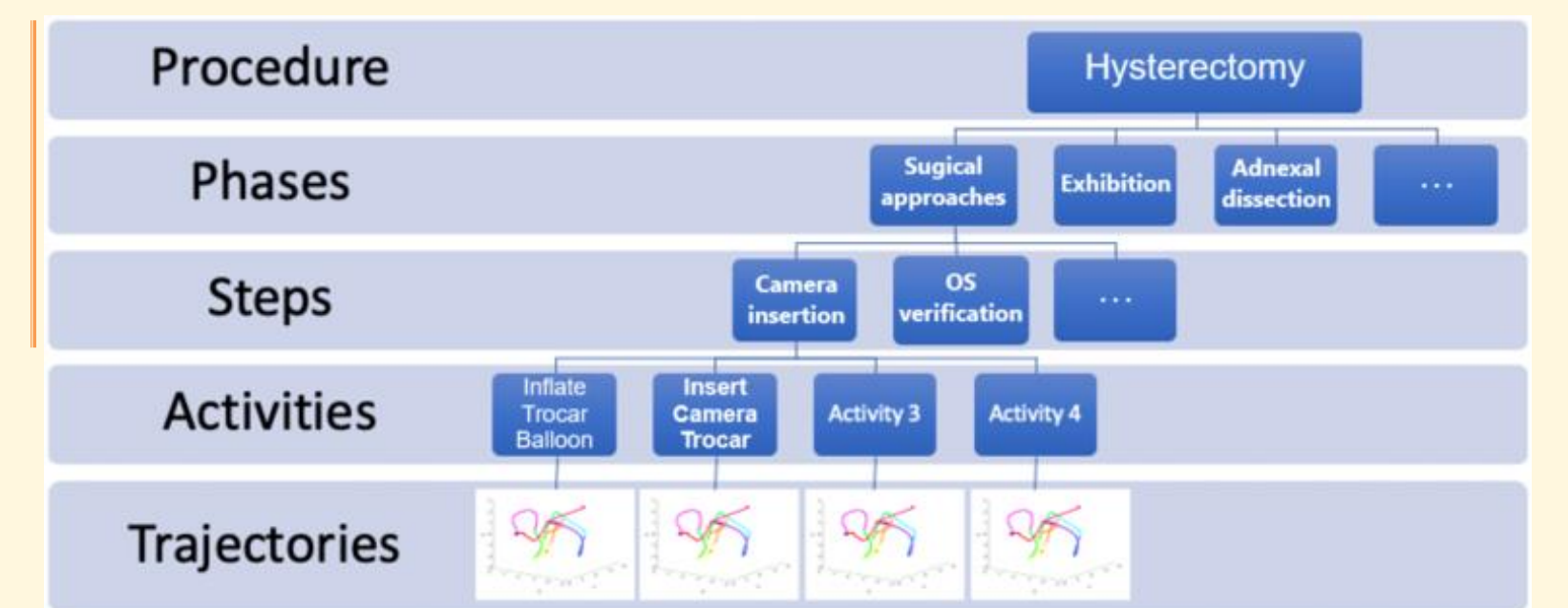
60+ robotic hysterectomies performed in Rennes



Video



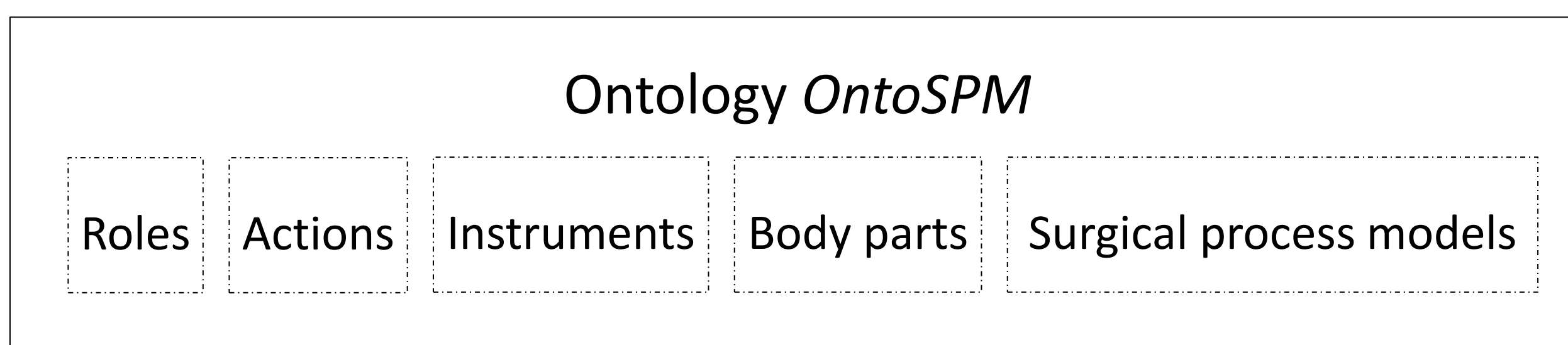
Kinematics



Procedural annotations

Semantic models of the surgical knowledge: Extension of an ontology

→ Knowledge is formally represented as relations between sets of entities

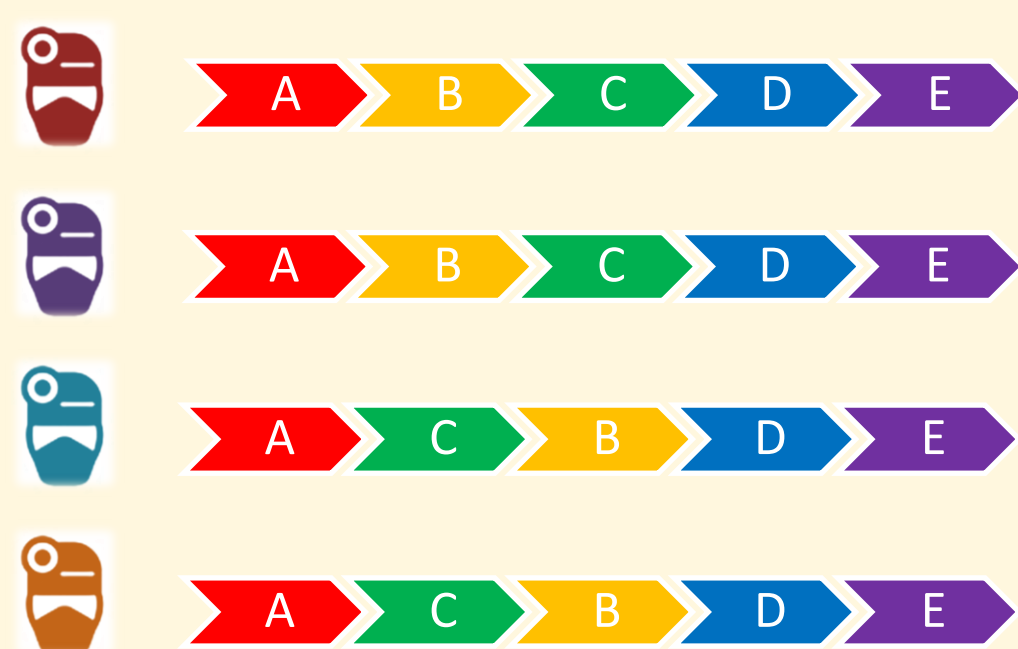


HysterOntoSPM
Extension of *OntoSPM* for hysterectomy

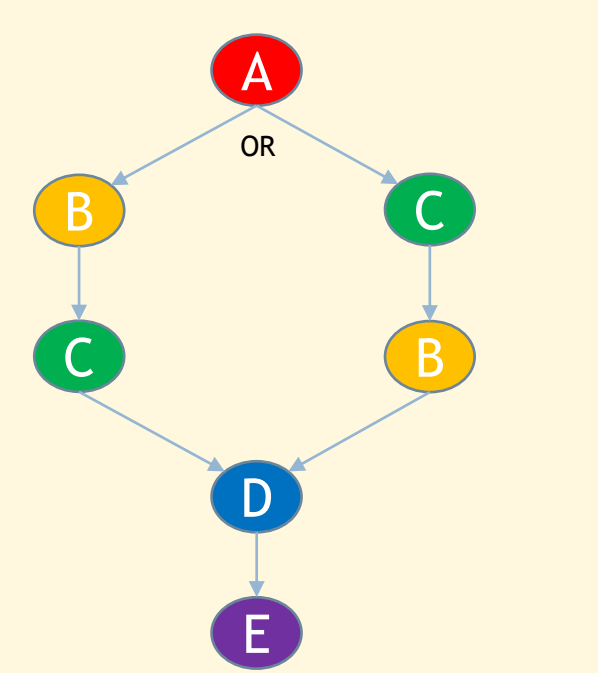
Hierarchical procedural models of surgical knowledge: Study of top-down and bottom-up approaches

Generic Surgical Process Model

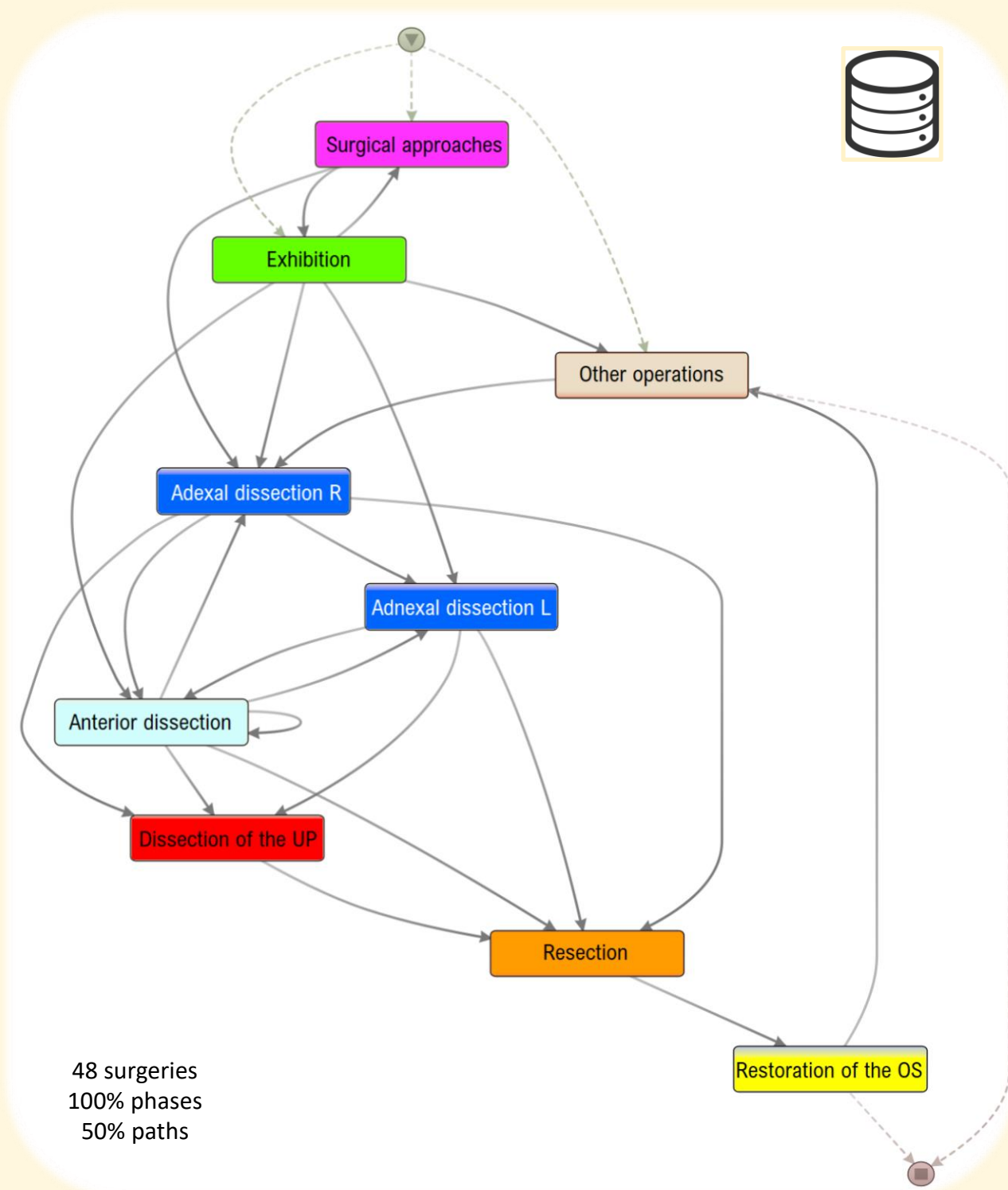
Individual SPM (iSPM)



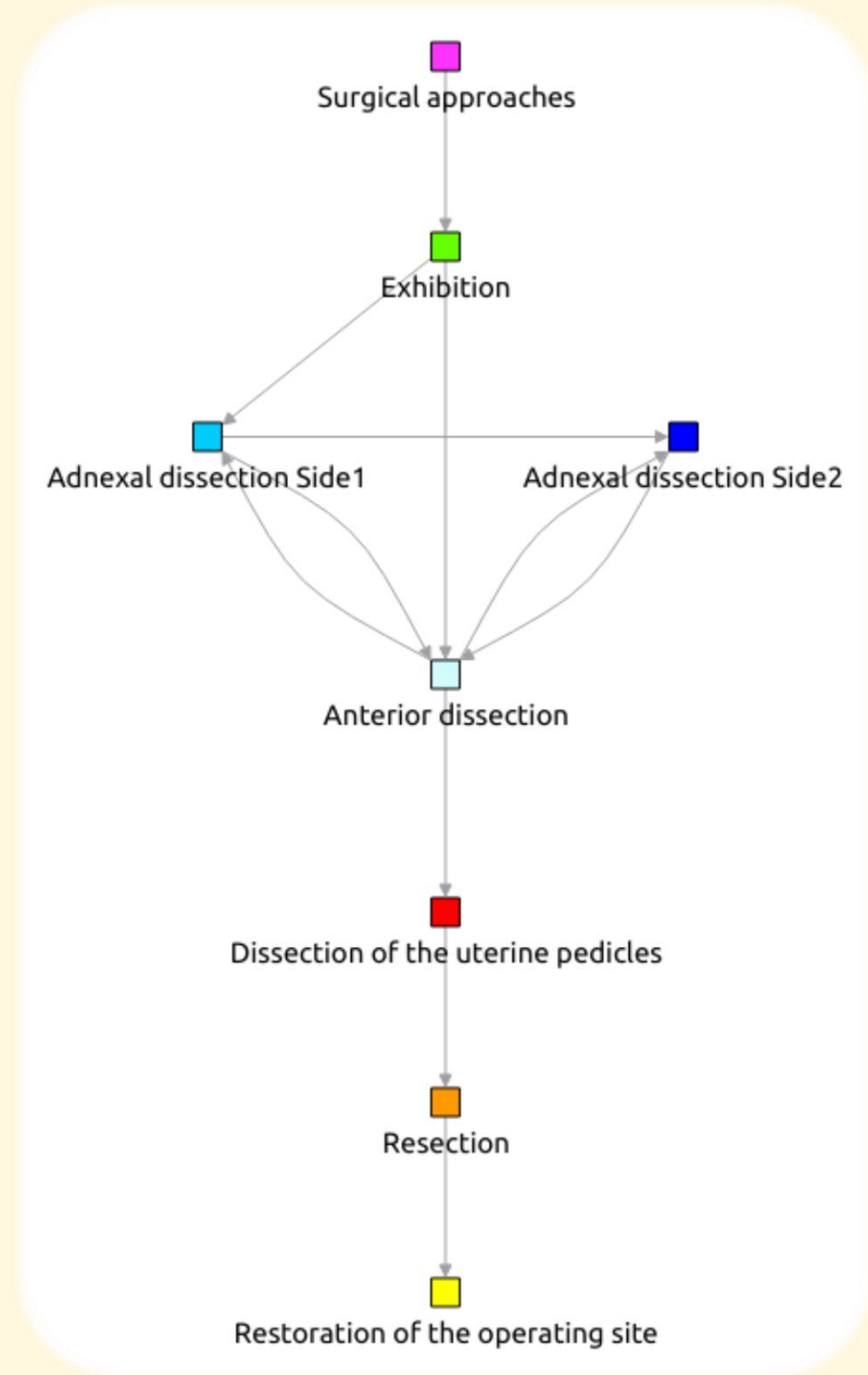
Generic SPM (gSPM)



Data driven gSPM



Knowledge elicitation gSPM

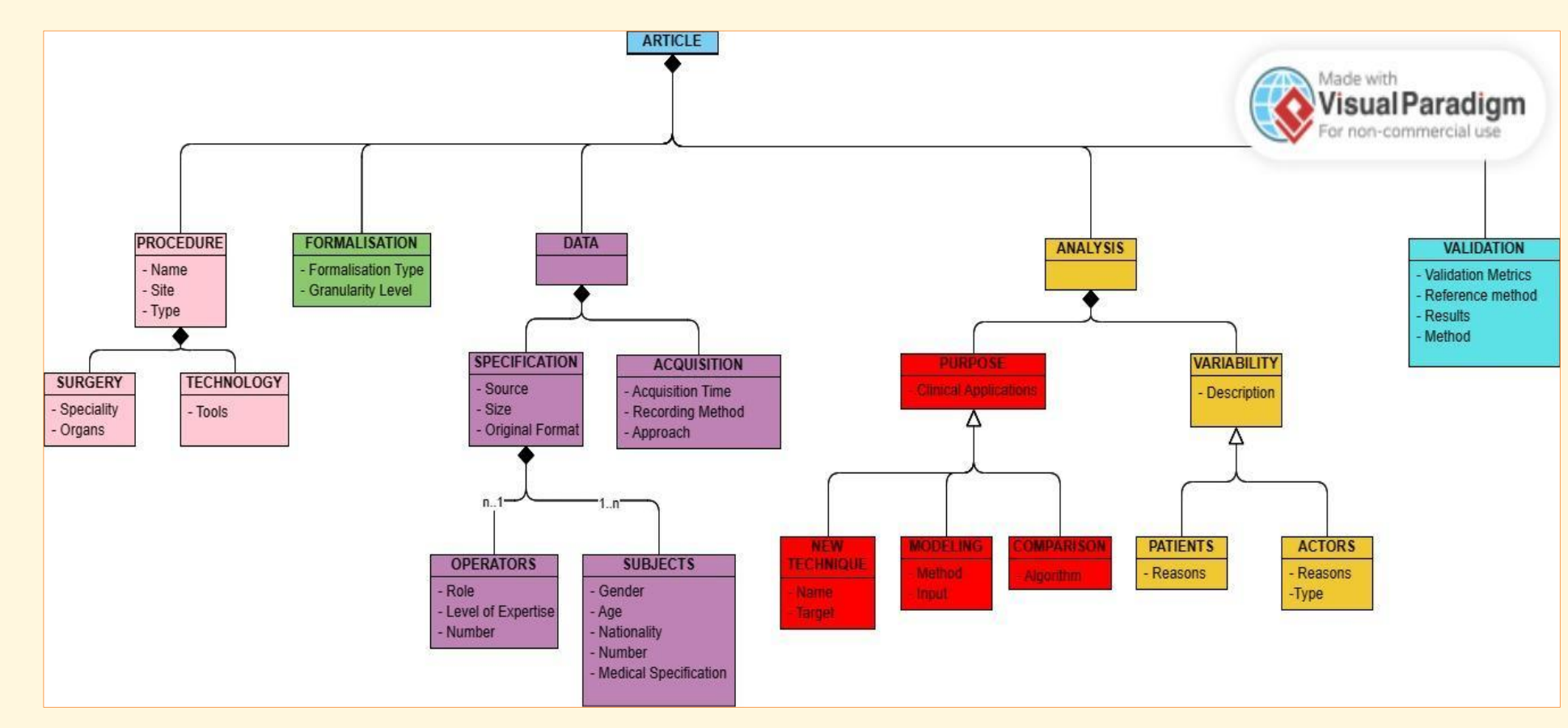


Variability in Surgical Procedures and Workflow

Request:
(" Surgical Process Analysis" OR " Surgical Process Models" OR " Surgical Workflow" OR "Surgical Sequential Procedures") AND (" Variability" OR " Procedural Variability")

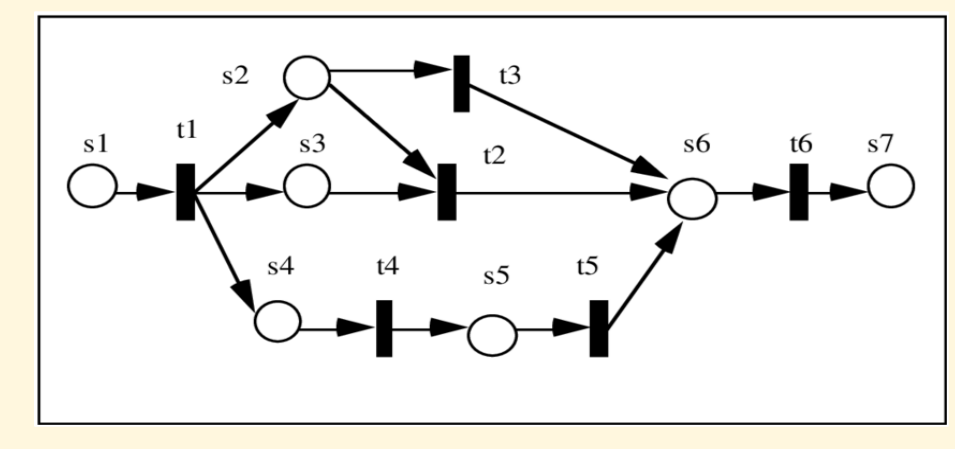
SCIENCE DIRECT:
172 Articles

Around 23 Research articles

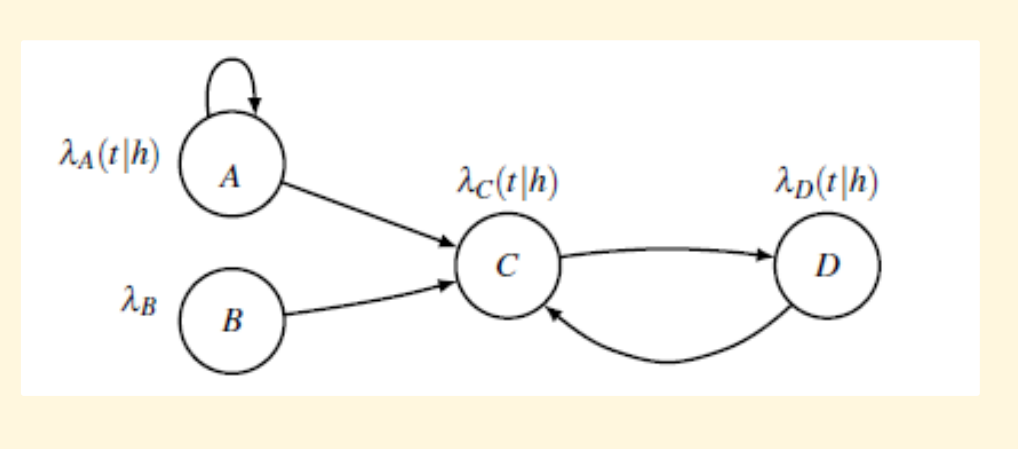


Graphical Event Model (GEM)

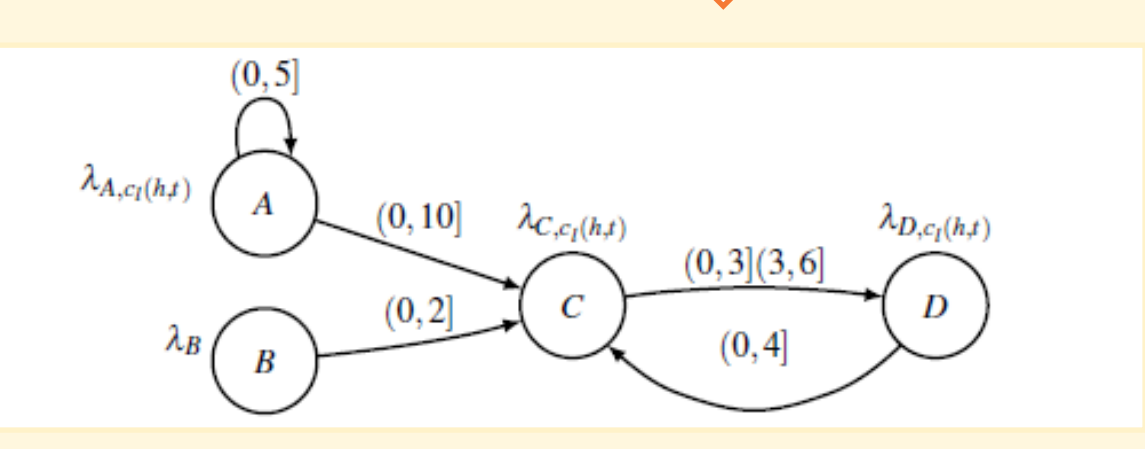
Knowledge elicitation Petri net



Knowledge elicitation GEM



Data Based GEM



Future work: Trajectory data analysis

