

Agence Nationale de la Recherche

SPARS Sequential Pattern Analysis in Robotic Surgery: Understanding surgery

MediCIS LTSI, Inserm/UR1

LinkMedia, Expression, IRISA/Inria

Université Bretagne Sud

DUKE, LS2N, University Nantes/CNRS/IMT

CHU Rennes

Context

FRANCE

Surgery is a highly complex entity to understand



Data acquisition and annotation

60+ robotic hysterectomies performed in Rennes





Procedure	Hysterectomy
Phases	Sugical approaches Exhibition Adnexal dissection
Steps	Camera OS insertion verification
Activities	Inflate Insert Trocar Camera Activity 3 Activity 4



yet multiple sources of variability

Semantic models of the surgical knowledge: Extension of an ontology

→ Knowledge is formally represented as relations between sets of entities

Ontology *OntoSPM*

Roles Actions Instruments Body parts Surgical process models

HysterOntoSPM Extension of *OntoSPM* for hysterectomy

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

Generic Surgical Process Model		Variability in Surgical Procedures and Workflow		
Individual SPM (iSPM)	Generic SPM (gSPM)	Request:	ARTICLE	Made with Visual Paradigm







("Surgical Process Analysis" OR "Surgical Process Models" OR " Surgical Workflow" OR "Surgical Sequential Procedures") AND PROCEDURE (" Variability" OR " Procedural Variability") - Name - Site - Type Acquisition Time Recording Method - Speciality - Organs **SCIENCE DIRECT:** - Tools 172 Articles Reasons Around 23 Research articles Aedical Specific



Future work: Trajectory data analysis



