# SunSet: Scrub Nurse Non-technical Skills Training System

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## Context

- Necessity to ensure scrub nurses practice of adverse events or rare surgical procedures
- Hospital requirements with polyvalent scrub nurses

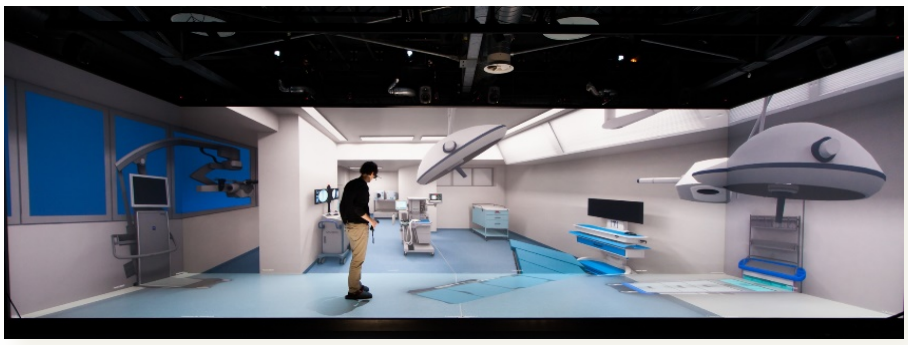
The SunSet project aims at:

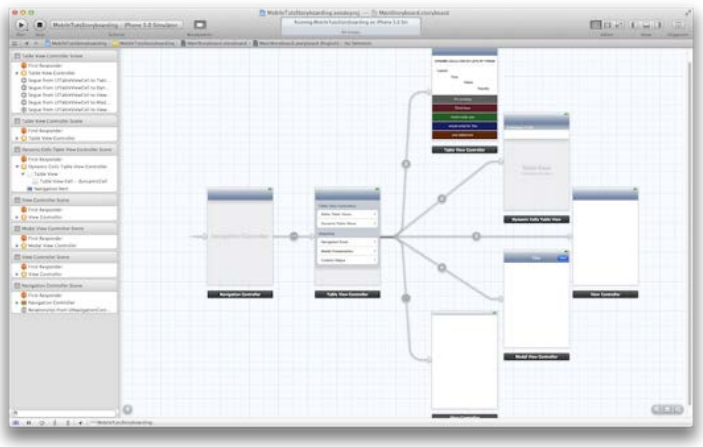
- Overcoming the limitations of existing systems:
  - costly and subjective human based training in sensitive clinical environments
  - non-realistic simulated environments
  - assessment of technical skills only
  - lack of quantitative metrics
  - lack of flexibility
- Proposing a new paradigm in surgical teaching and assessment of non-technical skills
- Reducing teaching cost and improving its quality
- Developing and assessing a new generation of virtual reality based surgical training system [1] covering inter-personal non-technical skills

## Motivations

- Development of an innovative training software suite based on immersive and collaborative virtual reality technology for training and evaluating non-technical skills
- In agreement with the recommendations of the Haute Autorité en Santé (HAS) for a better teaching and evaluation of surgeons using simulation systems, covering the required surgical skills [6]
- Integration of methods and systems developed in the CominLabs S3PM project
- Implementation and evaluation of neurosurgical scrub nurses training sessions
- Pluridisciplinarity:
  - Medical professionals (scrub nurses, surgeons)
  - Psychologists
  - Computer scientists and engineers (virtual reality, knowledge representation, formal methods, surgical procedure modelling)

## SunSet Training





SunSet Author


SunSet Eval

## Content specification

- Study of a shared working memory model between real and virtual actors in virtual environments
- Definition of simulation scenarios according to work domain analysis and actual observations [5]
- Adjustment of evaluation of non-technical skills forms for scrub nurses [2, 4]

## Authoring and implementation

- Scenario authoring tools for trainers
- Specification of hardware requirements
- Implementation available on immersive VR platforms
- On-line semantic assessment of simulated scenarios
- Addressed to junior and senior scrub nurses

## Evaluation

- Cognitive and interpersonal skill ***metrics*** [3]
- Automatic verification of scenarios based on semantic checking and ontology reasoning
- Evaluation tools to compare the qualitative and quantitative progress over time

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4. Mitchell, L., Flin, R., Yule, S., Mitchell, J., Coutts, K. , Youngson, G. (2013). Development of a behavioural marker system for scrub practitioners' non-technical skills. *Journal of Evaluation in Clinical Practice*, 19: 317-323.
5. Clarke D. B., Kureshi N., Hong M., Sadeghi M. and D'Arcy R. C. N. (2016). Simulation-based training for burr hole surgery instrument recognition. BMC Medical Education 16:153.
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