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COMPUTATIONAL METHODS IN VIRTUAL AND COMPUTER PLANNED SURGERY

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ABSTRACT

The minisymposium acknowledges the increasing role of computational tools in surgery and the relevance of the simulation of surgical procedures.
The world healthcare market can receive large beneficial effects even from minimal improvements of surgical technologies. The increasing availability of faster computers and robust computational methods have opened up new possibilities in terms of complex bio-physical modeling at the organ level, which can link to the tissue level, as well as micro structural and molecular levels, to allow prediction of the outcomes of complex surgical interventions. While computer-assisted robotic surgery is now routinely performed, the use of computational modeling for surgical intervention is in its infancy. Through this and other similar symposia, we hope to nurture this rapidly growing community.

Topics of interest include (but are not restricted to) the following:
- Novel computational techniques (continuum, atomistic and continuum level) for simulation of surgical procedures
- Tissue and organ models for surgical application
- Constitutive equations
- Modeling of bio-fluid mechanics for surgical applications
- Electro-thermal modeling
- Computational models of injury and trauma surgery
- Virtual tools for surgical simulation and planning
- Real time computational tools for interactive surgical training
- Computational techniques for radiation and chemotherapy.