
# Call For Papers

www.cistib.org/sashimi/

**Important Dates**

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| Registration Opens: | **Apr 25th 2017** |
| Submission Deadline: | **June 12th 2017** |
| Notification of Decisions: | **July 13th 2017** |
| Workshop Event: | **Sept 10th 2017** |

The MICCAI community has always been close to the idea of creating simulated or synthetic data to understand, develop, assess, and validate image analysis and reconstruction algorithms. From very basic digital phantoms all the way up to very realistic in silico models of medical imaging and physiology, our community has progressed enormously in terms of the available techniques and their applications. For instance, mechanistic models (imaging simulations) emulating the geometrical and physical aspects of the acquisition process have been used now for a long time. Advances on computational anatomy and physiology have further enhanced the potential of such simulation platforms by incorporating structural and functional realism to the simulations that can now account for complex spatio-temporal dynamics due to changes in anatomy, physiology, disease progression, patient and organ motion, etc. just to name a few. More recently, developments in machine learning together with the growing availability of ever-larger scale databases have provided the theoretical underpinning and the practical data access to develop phenomelogical models (image synthesis) that learn models directly from data associations across subjects, time, modalities, resolutions, etc. These techniques may provide ways to address challenging tasks in medical image analysis like cross-cohort normalization, image imputation in the presence of missing or corrupted data, transfer of knowledge across imaging modalities, views or domains. To this date, however, these two main research avenues (simulation and synthesis) remain pretty much independent efforts in spite of sharing common challenges. This satellite workshop, building on the successful 2016 edition, continues to provide a state-of-the-art and integrative perspective on simulation and synthesis in medical imaging for the purpose of invigorating research and stimulating new ideas on how to build theoretical links, practical synergies, and best practices between these two research directions.

**Specific topics of interest include, but are not limited to, the following**:

- Fundamental methods for image-based biophysical modeling and image synthesis
- Biophysical and data-driven models of disease progression or organ development, organ motion and deformation, image formation and acquisition
- Segmentation/registration across or within modalities to aid the learning of model parameters
- Imaging protocol harmonization approaches across imaging systems, sites and time points
- Image synthesis for normalization and spatio-temporal intensity correction
- Cross modality (PET/MR, PET/CT, CT/MR, etc.) image synthesis
- Simulation and synthesis from large-scale databases
- Automated techniques for quality assessment of simulations and synthetic images
- Image synthesis in high dimensional spaces (vectors, tensors, spatio-temporal features, etc.)
- Handling uncertainty and incomplete data via simulation and synthesis techniques
- Evaluation and benchmarking of state-of-the-art approaches in simulation and synthesis
- Novel ideas on evaluation metrics and methods in image-based simulation and image synthesis
- Normative and annotated datasets for benchmarking and learning models
- Applications of image synthesis/simulation in super resolution imaging and multi/cross-scale regression, registration, segmentation, denoising, fusion reconstruction and real-time simulation of biophysical properties

Further information about the workshop, author instructions, submission guidelines, and our invited speaker are available at: www.cistib.org/sashimi/

**Workshop Chairs:**

Sotirios A Tsaftaris, *University of Edinburgh, UK*
Ali Gooya, *University of Sheffield, UK*
Alejandro F Frangi, *University of Sheffield, UK*
Jerry L Prince, *Johns Hopkins University, USA*

**Contact the organizers:** sashimi@cistib.org