

THE 8th EDITION OF SMC-IT WILL BE HELD VIRTUALLY

CALL FOR PAPERS

SMC-IT 2021

8th International Conference on Space Mission Challenges for Information Technology

July 27-29, 2021

Sponsored by: IEEE Computer Society and the Technical Committee on Software Engineering

Every two years, the International Conference on Space Mission Challenges for Information Technology (SMC-IT) gathers system designers, engineers, scientists, practitioners, and space explorers with the objective of advancing information technology for space missions. The forum will provide an excellent opportunity for fostering technical interchange on all hardware and software aspects of IT applications in space missions.

The conference will focus on current information systems practice and challenges as well as emerging information technologies with applicability for future space missions. Information systems in all aspects of the space mission will be explored, including flight systems, ground systems, science data processing, engineering and development tools, operations, and telecommunications. The entire information systems lifecycle of the mission development will also be covered, such as conceptual design, engineering tools development, integration and test, operations, science analysis, and quality control.

This edition of SMC-IT will be held **virtually**.

TECHNICAL TOPICS

Topics of interest include, but are not limited to, the following:

- * **Data Analytics and Big Data:** knowledge extraction and management; data mining and analysis; data science life cycle; cloud computing in space; quantum computing; neuromorphic computing
- * **Advanced Computing for Novel Instruments and Improved Operations:** novel exploitation techniques, algorithms, and data analytics; machine learning and artificial intelligence; sensor networks
- * **Intelligent and Autonomous Spacecraft:** intelligent systems; computational intelligence; artificial intelligence; explainable AI; autonomy and autonomous systems; UAV/UAS in space; cooperative systems / swarming
- * **Robotics for Exotic Mission Destinations:** novel space exploration concepts enabled by robotic advancements; humans working with robots in space
- * **Robotic Manufacturing and Assembly of Large Space Structures:** 3D printing in space; in-space manufacturing; robotics cooperation and interaction; telerobotics; construction of structures on other planets/moons using *in situ* materials; CAD tools for in-space assembly
- * **Space Networking:** resilient communications; space-terrestrial internetworking and interoperability; standardization
- * **Cybersecurity:** securing federal networks; protecting critical infrastructure; cyber policies; international law; multi-level security; defensive cyber operations

- * **Fault-Tolerant Space Processing, Memory, and Storage:** innovative resilient architectures; fault and power management approaches; architectures for embedded artificial intelligence, big data, robotic vision, intelligent systems applications, and resource-constrained environments
- * **Software Reliability for Mission-Critical Applications and Safety of Life:** verification and validation approaches; design for test; re-usable software architectures; verification of complex systems; DevSecOps
- * **Advanced Ground Control:** mission planning and scheduling; distributed and collaborative mission planning; human-machine interactions; design for change; the impact of agile development and continuous integration / continuous deployment; the increasing velocity of ground system development
- * **Augmented Reality/Virtual Reality Applications:** AR/VR applications to telerobotics, data processing, mission operations, space science analysis; video game technology advancing space capabilities; training astronauts

The SMC-IT 2021 Technical Committee is seeking three kinds of submissions at this time: full papers, posters, and mini-workshop proposals.

FULL PAPER & POSTER SUBMISSIONS

SMC-IT 2021 solicits novel papers from all sectors of the space and aerospace community, including: earth orbiting systems, deep space missions, ground support systems, instruments, scientific data exploitation, landers, rovers, and probes. The conference will address civil, military, and commercial application areas for human and robotic missions.

SMC-IT 2021 will again use a single-pass, full-paper review process. Full papers can be up to 8 pages in length and require a verbal presentation. For full papers, a separate abstract (between four paragraphs and one page in length) **must** be submitted first, which will be used by the PC to identify the appropriate reviewers efficiently. Authors of full papers must submit a final version of their paper of up to 8 pages at the outset.

Proposals for posters can be up to 2 pages in length. Poster authors or teams will be given multiple opportunities to discuss their work with interested attendees in poster sessions. Successful poster proposals will receive further guidance on the exact size and format for their posters. We particularly encourage college students to participate and submit original paper and poster contributions.

All papers accepted for SMC-IT 2021 will be published in the IEEE conference proceedings, indexed in the IEEE Xplore database. Note that IEEE has a “Podium and Publish” policy for conferences, which means that no manuscript will be published in IEEE Xplore without first being presented at the conference. Some selected papers may be invited to appear in a special issue of a reputable journal in the field.

MINI-WORKSHOP SUBMISSIONS

SMC-IT 2021 will continue the highly successful mini-workshop session format to explore specific emerging technology themes in greater depth. Each mini-workshop typically runs as one track for one day, or one or two half days, and may incorporate invited and/or contributed papers.

To propose a mini-workshop topic, please submit a 1-2 page abstract including the theme, scope, and goals of your workshop idea, as well as any potential speakers already identified. Please also indicate whether you prefer a full-day, or one or two half-day time-slots.

FORMAT

Full Papers can be up to 8 pages in length. Templates can be found on the SMC-IT 2021 web site: <http://smc-it.org>

SCHEDULE

July 23, 2020	Call for Full Papers, Posters, and Mini-Workshop Proposals
October 5, 2020	Author Submission Website Open
February 15, 2021	Abstract Submission Deadline (extended)
February 22, 2021	Final Deadline for Papers, Posters and Mini-Workshop Proposals (extended)
April 3, 2021	Authors Acceptance Notification (extended)
May 3, 2021	Early-bird Registration opens
May 7, 2021	Final Manuscripts Due (incorporating reviewer comments) (extended)
July 27-29, 2021	Conference

To join the SMC-IT mailing list, please send a blank email to smc-it-info-join@baylor.edu. To be removed from the list, please send a blank email to smc-it-info-leave@baylor.edu. For general enquiries, email smc-it-chairs@baylor.edu.

We look forward to seeing you online in July 2021!

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