March 31 - April 4, 2025

CONFERENCE WEBSITE: https://conf.researchr.org/home/icst-2025/iwct-2025

About the Conference

We invite submissions of high-quality papers presenting original work on both theoretical and practical aspects of applying combinatorial methods to testing problems, targeting software, systems-of-systems or other domains (including, but not limited to, biotechnology, mechanical engineering, manufacturing, quantum computing, finance and disaster research).

Each submission (in any category) must conform to the IEEE conference proceedings template, specified in the IEEE Conference Proceedings Formatting Guidelines (https://www.ieee.org/conferences/publishing/templates.html). All papers will be reviewed by at least three members from the program committee. If a submission is accepted, at least one author of the paper is required to attend the workshop in-person with an author registration and present the paper for it to be published in the ICST 2025 workshop proceedings.

Please direct any questions concerning submissions to IWCT 2025 to: iwct2025@sba-research.org

Important Dates

MAR 31

CONFERENCE DATE

March 31 - April 4, 2025

Submission

EasyChair instance of ICST 2025, please select track ‘IWCT 2025’: https://easychair.org/conferences/?conf=icst2025

Full and short papers

We invite submissions for full papers (up to 10 pages, including references) as well as short papers (up to 4 pages, including references). Accepted papers in these two categories – full and short – will be part of the proceedings of IWCT 2025.

Journal-First

The aim of the Journal-First (JF) submission category is to further enrich the program of IWCT, as well as to provide an overall more flexible path to publication and dissemination of original research that is within the scope of IWCT. A submission in this category must adhere to the following criteria:

1. It should be clearly within the scope of the workshop.
2. It should be recent: it should have been accepted and made publicly available in a journal (online or in print) by January 1, 2023 or more recently.
3. It has not been presented at, and is not under consideration for, Journal-First tracks of other

conferences or workshops.
4. The submission has to be in the form of a 2-page extended abstract and has to provide a concise summary of the published journal paper. Journal-First submissions must be marked as such in the submission’s title, and must explicitly include full bibliographic details (including a DOI) of the journal publication they are based on. Since the referenced journal papers have already been reviewed and accepted by the corresponding journals, submissions in the JF category will not be reviewed again for technical content. Submissions will be judged on the basis of the above criteria, but also considering how well they would complement the workshop’s technical program. Accepted submissions in this category will be part of the proceedings of IWCT 2025, with the title equal to the original title of the article with the prefix “Summary of”.

Posters

In addition to the traditional program topics from the past years, and taking advantage of the fact that some of the lead CT tool developers have expressed interest in participating again in the fourth iteration of the CT competition, we would like to offer with the poster session a low-threshold opportunity – especially targeting industry – to present activities within the scope of the workshop to the participants of IWCT. A tool demonstration can be given alongside a poster. In case a poster contribution wishes to provide more details or information, but does not want to submit a short or full paper, the authors can choose to submit in

addition to the poster a maximal 2-page extended abstract detailing the content of the poster. The title of the extended abstract has to have the prefix “Extended Abstract of Poster” and these extended abstracts – if accepted – will also appear in the proceedings of IWCT 2025.

Post-proceedings of IWCT 2025 in Section VI of Journal SN Computer Science

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We plan to organize a call among the best papers of the workshop to submit extended versions to the journal SN Computer Science in the Section ‘Combinatorial Methods and Models in System Testing’ (https://resource-cms.springernature.com/springer-cms/rest/v1/content/23087782/data/v2). More information will be provided at the workshop.

Topics for submissions

Topics of interest for submissions include, but are not limited to:

* Combinatorial testing workflow

- Modeling the input space for CT – the input to CT algorithms consists of the desired strength of coverage, a set of parameters together with their respective values, and constraints on value combinations. This input should capture correctly the points of variability in testing the system. While this input is clearly crucial for the effectiveness of CT, it is a difficult problem.

- Efficient algorithms to generate test plans with small size for t-way testing for t) 2, involving support of constraints on combinations that are possible.
- Determination of expected system behavior for each test case – while the test cases are automatically generated by the CT algorithm, determining the expected system behavior is currently usually a manual task.
- Executing CT test plans – the result of CT algorithms is a list of tests, where a test is represented by a value assignment for each parameter. There is still significant effort in transforming this representation into actual tests that a tester or testing tool can execute.
- Combinatorial testing based fault localization.
- Implementation of CT in existing testing infrastructures.
- Handling changes in test requirements – current CT methods focus on one-time generation of a test plan from a given set of requirements, but test requirements are almost never static, and tend to change between different releases and versions. However, generating a new plan of tests for each release may not be practical either.

* Real-world experience in deployment of combinatorial testing
- Empirical studies and feedback from practical applications of CT.
- CT targeting AI/ML-based systems.
- CT targeting security, including hardware and chip security.
- CT targeting autonomous, concurrent and real-time systems.
- CT targeting cloud computing systems and use of

combinatorial methods in cloud architecture.
- CT targeting feature models for software product lines.
- CT targeting other domains; e.g., study of gene regulations and other biotechnology applications, mechanical engineering, testing in manufacturing hardware, quantum computing domain, financial domain or disaster management.

* Applicability of combinatorial testing
- Comparison and combination of CT with other dynamic verification methods.
- Investigation of historical records of failures to determine the kind of CT which may have detected underlying faults.
- Methodology used for test space modeling and determination of interaction coverage requirements.
- Evaluation and return of investment metrics to assess the degree of usefulness of CT.
- Discussion of challenges and open problems in the application of CT in an industrial setting.

* Combinatorial and complementing methods
- Combinatorial analysis of existing test plans – analyzing test plans not generated by a CT algorithm in light of a combinatorial test space.
- Test plan reduction and completeness – both under stable, and under changing test requirements.
- CT and coverage metrics – combining the two, and studying the relation between them.

TOPICS OF INTEREST 1 topics

Research papers are invited in, but not limited to, the following areas:

- Uncategorized