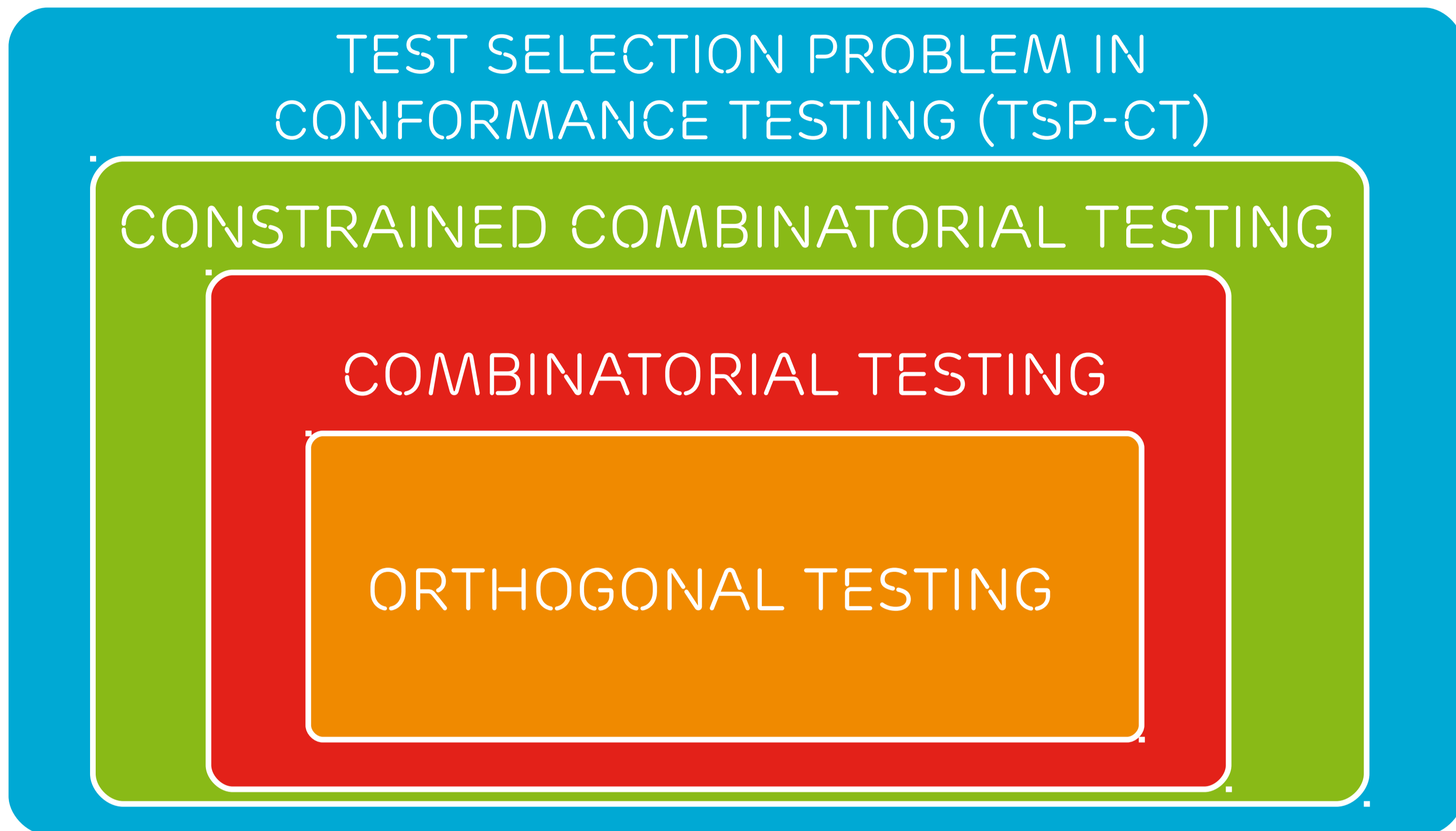


COMBINATORIAL TESTING

RESULTS AND APPLICATIONS IN TELCO CLOUD

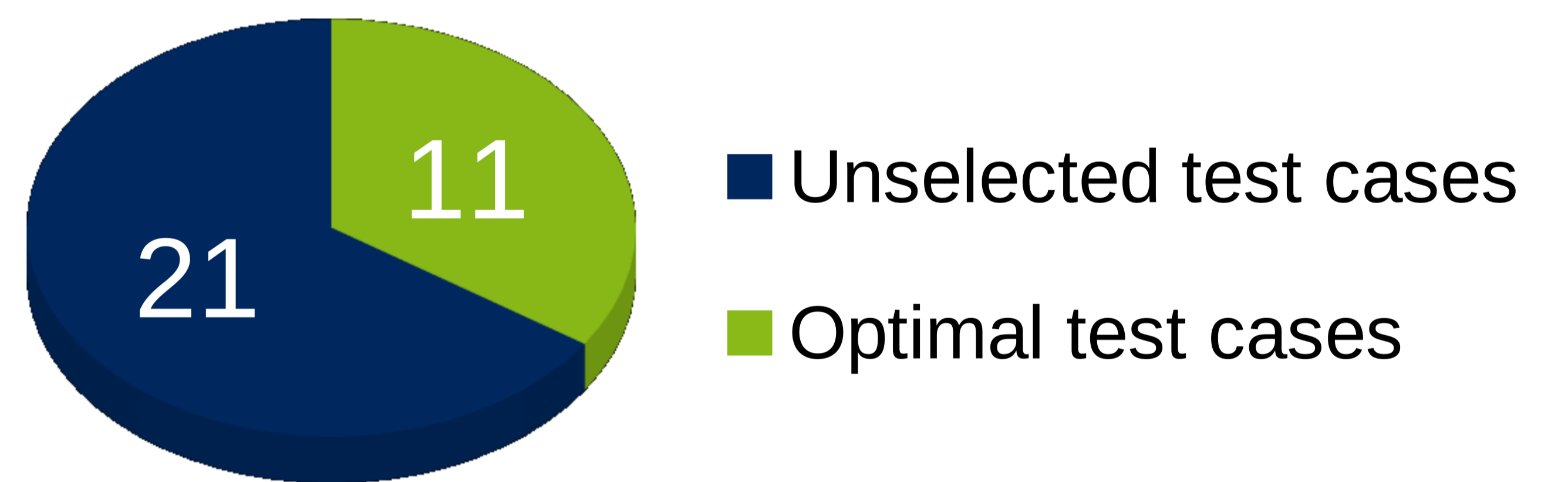


An Ericsson cloud product needed to be tested in a CI pipeline, our task was to prioritize and select among the expensive executions of test cases.

Objective: Select minimal number of test cases that find all errors when it is supposed that no failure involves more than 3 of parameter settings interacting! (strength = 3)

Result: Using CCT in our application we could achieve 11 test cases, which is the optimal solution. (Instead of 32)

1	2	3	4	5	6	7	8	9	10	11	INVALID			
✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	?	?	?	?
✓	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	?	?	?
✓	✗	✓	✗	✗	✗	✓	✗	✗	✓	✗	?	✓	✓	?
✗	✓	✗	✓	✓	✗	✗	✓	✗	✗	✓	?	✓	?	✗
✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	?	✗	✗



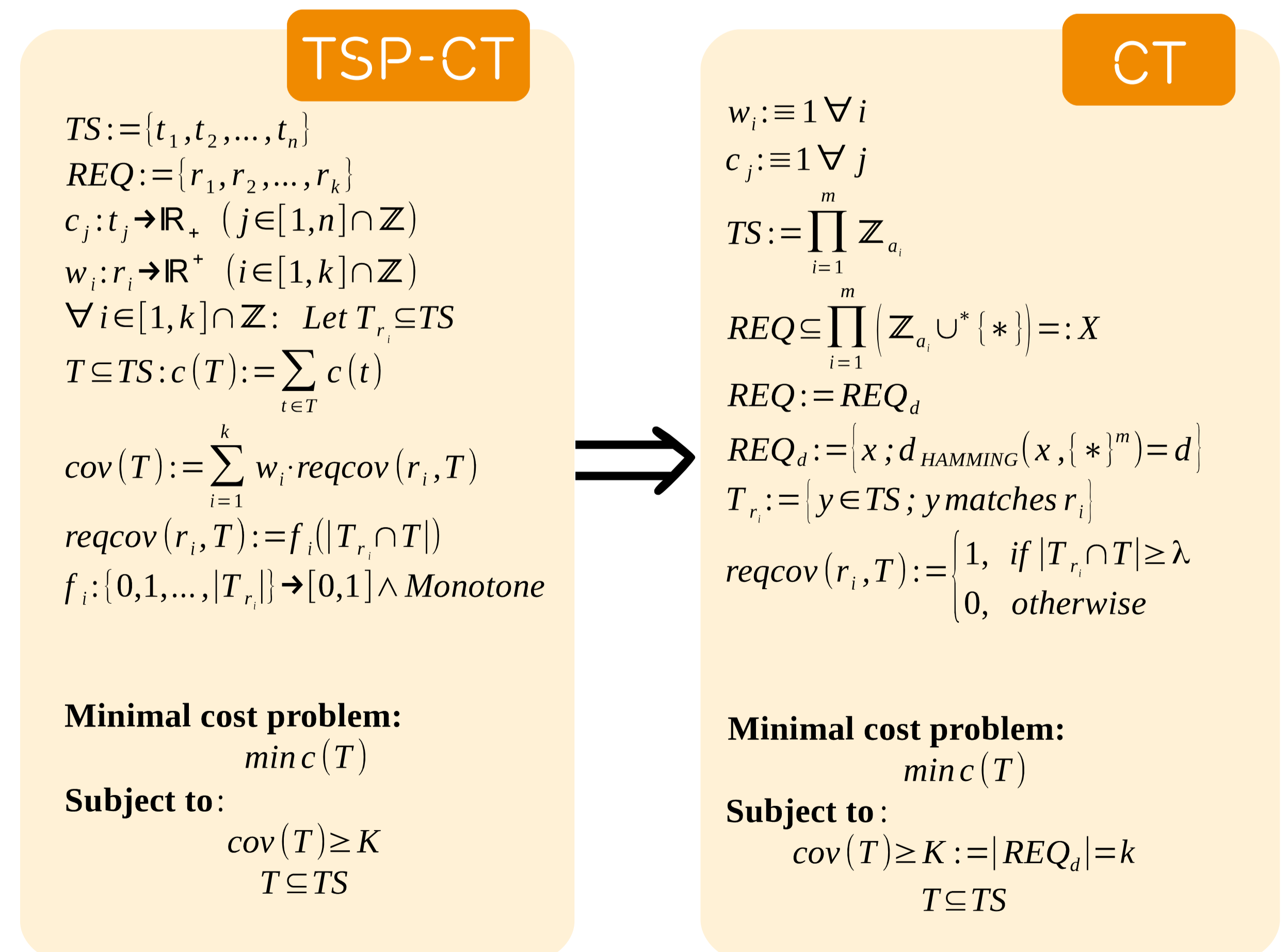
Model generation and solving tools were developed, used only Ericsson development and free and open source software.

Thus proving that mixed integer prog-ramming is an efficient method for finding combinatorial test case coverings, improved: 10 boolean parameters of strength 3.

ID	1	2	3	4	5	6	7	8	9	10	11	12
1	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✗
2	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗
4	✓	✗	✓	✓	✓	✓	✗	✗	✓	✗	✗	✗
5	✓	✗	✓	✗	✓	✗	✓	✓	✗	✓	✓	✓
6	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
7	✗	✓	✓	✓	✗	✗	✓	✗	✓	✓	✓	✓
8	✗	✓	✓	✗	✓	✗	✗	✗	✓	✓	✓	✗
9	✗	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓
10	✗	✗	✓	✓	✗	✓	✗	✓	✗	✗	✓	✓
11	✗	✗	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗
12	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✗

Old record is 13 at page 20: Rick Kuhn: Introduction to Combinatorial Testing, National Institute of Standards and Technology Gaithersburg, MD

Classification result with proof: (C)CT is a special case of TSP-CT – in order to (re)use former development and results by Ericsson.



Terms from: Tibor Csöndes, Balázs Kotnyek: Greedy Algorithms for the Test Selection Problem in Protocol Conformance Testing. Journal of Circuits, Systems, and Computers 11(3): 273-282 (2002)