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A Systematic Review on the Applications of UPPAAL

The presentation presents a systematic review on possible applications of the UPPAAL tool. This tool, an integrated environment for the modeling, validation, and verification of real-time systems modeled as networks of timed automata, is currently used in various domains of science and engineering. A systematic review of the literature from the years 2022 and 2023 was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure. The aim was to identify the current application areas of various versions of the UPPAAL tool, including CORA, TIGA, SMC, and Stratego. A total of 188 studies were included in the review. Quantitative information on the distribution of research papers regarding access options, scientific databases, types of papers, and geographical location was obtained. This review highlights the need for further development of the UPPAAL tool. In addition, it includes a brief comparison with other mainstream formal validation tools, explores the applicability of different UPPAAL versions, and offers practical guidelines for version selection. Finally, key open challenges and their potential solutions are discussed to support future research and tool enhancement.