

River basin management with SPIN *

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This paper presents the use of the SPIN model checker as the core engine to build Decision Support Systems (DSSs) to control complex river basins during flood situations. Current DSSs in this domain are mostly based on simulators to predict the rainfall and the water flow along the river basin.

In this paper, we propose a scheme that integrates simulators in the water domain with additional logic in PROMELA to represent basin elements, such as dams, their management rules, the evolution of dam parameters (e.g. level or discharge capacity), and user defined constraints in the whole basin over time. Then, we use the exploration capabilities of SPIN to find out which sequences of operations over the dams produce a global behaviour that mitigates the effect of floods according to user defined constraints along the river basin. Although the method is general for any river basin with dams, it has been evaluated in a real basin in the south of Spain.

This paper has been full published in [1].

References

- [1] M. del Mar Gallardo, P. Merino, L. Panizo & A. Salmerón (2016): *River Basin Management with SPIN*. In: *Dragan Bonaki; Anton Wijs (Eds.). Model Checking Software: 23rd. International Symposium, SPIN 2016 Co-located with ETAPS 2016, Eindhoven, The Netherlands, april 7-8, 2016. Proceedings, Lecture Notes in Computer Science*, pp. 78–96, doi:10.1007/978-3-319-32582-8.

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