

Constraint programming for optimal design of architectures for water distribution tanks and reservoirs: A case study [Programiranje ograničenja za optimalni projekt arhitekture spremišta i rezervoara za distribuciju vode: Analiza slučaja]

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A water distribution system is an essential component of any urban infrastructure system. Its design is commonly a hard task mainly due to the presence of several complex interrelated parameters.

Among others, some parameters to study are the water demand, pressure requirements, topography, location of resources, system reliability, and energy uses. In this paper, we focus on a real case of water distribution system in order to minimize installation costs by satisfying the given system requirements. We solve the problem by using state-of-the-art Constraint Programming techniques combined with Interval Analysis for rigorously handling continuous decision variables.

Experimental results demonstrate the feasibility of the proposed approach, where the global optimum is reached in all instances and in reasonable runtime.

Constraint programming

Optimization

Water distribution