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**MASADA: A modeling and simulation automated data analysis framework for continuous data-intensive validation of simulation models** (Conference Paper)Foguelman, D.<sup>ab</sup>, Bonaventura, M.<sup>ab</sup>, Castro, R.<sup>ab</sup><sup>a</sup> CERN, Geneva 23, Switzerland<sup>b</sup> Universidad de Buenos Aires, Buenos Aires, Argentina[View references \(24\)](#)

## Abstract

Complex networked computer systems are subjected to upgrades on a continuous basis. Modeling and simulation (M&S) of such systems helps with guiding their engineering processes when testing design options on the real system is not an option. Too often many system's operational conditions need to be assumed in order to focus on the questions at hand, a typical case being the exogenous workload. Meanwhile, soaring amounts of monitoring information is logged to analyze the system's performance in search for improvement opportunities. Concurrently, research questions mutate as operational conditions vary throughout its lifetime. This context poses many challenges to assess the validity of simulation models. As the empirical knowledge base of the system grows, the question arises whether a simulation model that was once deemed valid could be invalidated in the context of unprecedented operation conditions. This work presents a conceptual framework and a practical prototype that helps with answering this question in a systematic, automated way. MASADA parses recorded operation intervals and automatically parameterizes, launches, and validates simulation experiments. MASADA has been tested in the data acquisition network of the ATLAS particle physics experiment at CERN (Pestre, 1984). The result is an efficient framework for validating our models on a continuous basis as new particle collisions impose unpredictable network workloads.

## Author keywords

Continuous validation; Data analysis; DEVS; Integration; Process automation; Simulation

## Indexed keywords

**Engineering controlled terms:** Automation; Data acquisition; Data handling; Data reduction; Information analysis; Integration; Knowledge based systems; Modal analysis; Verification

Automated data analysis; Continuous validation; Data acquisition networks; DEVS; Networked computer systems; Particle physics experiments; Process automation; Simulation

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