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## **A BAYESIAN APPROACH FOR THE ASSESSMENT OF RISK PROBABILITY. CASE STUDY FOR DIGITAL RISK PROBABILITY**

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### **Abstract**

Our society is facing new challenges and risks, due to the interdependency of the elements comprising its critical infrastructure (such as energy, transports, and digital). This paper proposes a framework for the assessment of risk probability, presented for the case of the natural or man-made disasters that could affect the most important information systems in Bacău County. Considering overlapping chains of events that could potentially occur as consequences of a disaster, the model allows its user to vary certain parameters and observe the effects on the global, computed risk probability. The analysis behind integrates the design of a semantic graph that includes most of the hazardous events which have been recorded during the last years in the targeted area, and the Bayesian approach of uncertainty. A particular emphasis is placed on aspects concerning the risks associated to information systems. The model could be used to support the best decisions in a given situation, facilitating the focus on the most significant risks and especially on the protection of digital infrastructure.

*Key words:* Bayesian probability, critical infrastructure, information system, risk probability, semantic graph

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