



## Conferencia Nikolaos Limnios

25/10/2024

**PONENTE:** Nikolaos Limnios Université de Technologie de Compiègne, Sorbonne University Alliance, (France)

**TÍTULO:** Stochastic Models for Reservoirs

**DÍA Y HORA:** 31 de octubre, 9:00-14:00

### Summary

Reservoir problems are cases of inventory theory, which includes moreover dams, storage, etc. We will consider a finite reservoir with random input and a specific output rule. Such reservoirs are encountered, for example, in cities for the management of drinking water. In fact, water is taken from a source, i.e., a river, it is then treated in a complex treatment unit; then stored in one or more reservoirs to be distributed to users, i.e., individuals, companies, etc. The treatment unit is generally very complex and suffers breakdowns quite often. Without the reservoir, these breakdowns would lead to the water supply being stopped to users. This is generally unacceptable in our modern societies.

The reservoir will provide a buffer time for the repair of the treatment at the input. The larger the reservoir, the more time allocated to treatment will be important and the failure will not be perceived by users. But also, the larger the reservoir, the higher the costs of its construction and maintenance will be. So, we are in the presence of a problem of optimization of the size of the tank. Several other problems can be considered here. The evolution in average of the level of the tank in time; the average time of emptying (important for the problem of cavitation of the pumps at the outlet), etc. We will, under reasonable assumptions, build a Markovian model and try to answer the previous questions.



### **Short biography**

Nikolaos Limnios received his diploma from the AUTH, Greece in 1979; his DEA from University of Technology of Compiègne (UTC), France in 1980; and his PhD in 1983 from the same university. He received his Doctorat d'Etat in 1991 from UTC. He is a Professor in Applied Mathematics at UTC since 1993. He is the co-author of the books *Semi-Markov Processes and Reliability* (Birkhäuser, 2001); *Stochastic Systems in Merging Phase Space* (World Scientific, 2005); and *Semi-Markov Chains and Hidden Semi-Markov Models toward Applications* (Springer, 2008); *Applied Nonparametric Statistics in Reliability* (Springer, 2011); *Applied Probability - From Random Sequences to Stochastic Processes* (Springer, 2018), *Discrete-time Semi-Markov Random Evolutions and their Applications* (Birkhauser, 2023).