

Some mathematical tools applied to judicial affairs.

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This informal chat will describe certain possibilities offered by applied mathematics, which have shown to be useful in questions of judicial nature. Several of them pertain strictly to court usages, and the rest belong rather to the art of court administration.

As an example of the first type of techniques, topics of fuzzy logic will be introduced as valid methods for estimating the level of agreement between forensic experts involved in a judicial conflict. Also, the application of non parametric correlation tests, such as Kendall's Tau, will show its potential in a auditorship which was implemented under judicial supervision. The test allowed to prove the perpetration of a systematic fraud which was quietly executed with impunity during a long period of time.

On the other hand, queueing theoretical techniques are useful in the design and administration of a civil court as understood in Argentina and in many other countries which inherited roman legal procedures. In fact, it is possible to describe such a court as a sequence of queues in series of three blocks. Each of the blocks requires a different type of analysis due to the different nature of the legal work performed. Moreover, each desk of the court can be modelled as a stochastic system in which a natural labor pressure index is introduced by means of the Laplace transform. Graph theory is also useful in this type of modelling.

Finally, huge legal application forms, which nobody reads (moreover nobody knows if the numerical information they contain is real), can be studied statistically by the symmetric associated matrix. Of course, this study requires solving the characteristic polynomial of the given matrix, which has generally a very big degree. Several different application forms of the same nature lead naturally to a system of polynomial equations.