

English summaries

Xavier Bardina

Records: What is their probability? When do they appear? Which values do they take?

Given a sequence X_1, \dots, X_n, \dots of independent equally distributed random variables with a continuous probability distribution, we say that X_i is a *record* if it takes a larger value than each of the preceding ones. In this work we shall compute the expected number of records in a run of length n , and the probability of obtaining exactly r records in such a run. We shall show some results on the expected time till the r -th record occurs and about the probability distribution of that r -th record.

Keywords: records, extreme values, continuous distributions.

MSC2000 Subject Classification: 60G70.

Francesc Comellas

Deterministic models of complex networks

Recent studies have shown that a number of networks associated to complex systems belong to the new category of “scale-free small-world networks”. The mathematical description of these networks is often based in probabilistic models. However, deterministic models are useful to improve or complete the analysis of these networks obtained by probabilistic techniques or by simulation. In this paper we introduce the concepts and basic models which have been considered to analyze complex networks and we describe several deterministic models which are obtained from complete graphs.

Keywords: graphs, complex networks, scale-free networks, small-world networks.

MSC2000 Subject Classification: 90B10, 68R10.

Ana M. Debón, Francisco Montes

Statistical methods for life insurances

The study of mortality rate and its evolution is an important topic, due to their economic and social implications, for actuaries, statisticians and demographers. In this work we review several alternatives to measure mortality probabilities by means of dynamic models. These models take into account both the influence of population age and the calendar. We show an application to mortality data in Spain. We also comment on the future trends in the dynamic analysis of mortality rate.

Keywords: dynamic mortality rates, mortality prediction, ageing.

MSC2000 Subject Classification: 62P05.

Josep Maria Font

Compatibility in algebra, in logic and in computer science

This paper introduces the current view on the algebraic studies in Logic, especially in the domain of non-classical logics. The paper is organized around some pure algebraic concepts such as compatibility, Leibniz congruence, and the Leibniz operator. It is shown how these concepts allow to define a hierarchy of logics and to classify them according to their behaviour as far as their algebraization is concerned, that is, by the kind of relation they have with their algebraic models, and by the properties of these models. The paper ends with a brief survey of some of the most recent research lines in the context of the emerging field now called *Abstract Algebraic Logic*.

Keywords: abstract algebraic logic, indiscernibility relation, Leibniz operator, Leibniz hierarchy, algebraizable logic, protoalgebraic logic, deductive equivalence, translations.

MSC2000 Subject Classification: 03B22, 03G.
