Editorial

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This issue of Methodology and Computing in Applied Probability (MCAP) contains a collection of papers based on contributions presented at the 9th International Workshop on Applied Probability (IWAP 2018), held in Budapest, Hungary, from June 18 to June 22, 2018. The number of participants exceeded 320; they came from all parts of the World from 38 countries in five continents. The program included five plenary lectures, 142 invited, and 149 contributed talks.

The biennial IWAP conferences have taken place in different locations around the World; they started in 2002 in Venezuela, and the next workshops were organized in Greece (2004), the USA (2006), France (2008), Spain (2010), Israel (2012), Turkey (2014), Canada (2016) and Hungary (2018). The series' continuation, planned for in 2020, in Greece has been postponed to 2021 due to the current pandemic.

As the 2018 Budapest event's broad attendance demonstrates, IWAP rightfully claims its place among the major and very prestigious international conferences in applied probability, providing a forum for disseminating and discussing high-quality research in the field. The meetings' objective is to foster the share and exchange of ideas, experiences, and techniques in applied probability and offer a platform for advancing new methodologies and computational procedures. To achieve this, IWAP aims to bring together researchers and scientists engaged in applied probability, covering methodology and applications from diverse fields, including mathematics, statistics, physics, computer science, economics, engineering, biology, chemistry, and the social and health sciences.

In the 9th IWAP, the plenary lectures delivered by Jean Bertoin, Peter Friz, Ioannis Karatzas, Yuliya Mishura, and Victor Perez-Abreu provided insight into current trends in applied probability. A particular focus on financial applications marked the 2018 event; nine invited sessions were devoted to the field.

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A special highlight of the conference was when Nitis Mukhopadhyay handed out the Abraham Wald prize to Michael Baron and Jan Kalina. Rich social programs, including an organ concert in the gothic Mathias Church and a cruising gala dinner on the River Danube, helped strengthen old connections and create new ones in a relaxed environment.

This issue of MCAP contains 21 articles authored by influential scholars who are experts in the field of applied probability. While editing the collection of articles, a special effort was made to attract works covering a broad spectrum of research areas.

Alzaatreh et al. study the distributional characteristics of time and cost to start a business, and by introducing right-truncated and left-truncated T-X families of distributions obtain an excellent fit for those highly skewed data.

Arriaza et al. provide necessary and sufficient conditions for two non-negative random variables (with unimodal quantile densities ratio) to be ordered according to some stochastic orders. In addition, they unveil relationships between non-monotonic classes and positive aging classes of life distributions.

Ascione et al. consider a fractional Ornstein-Uhlenbeck process involving a stochastic forcing term in the drift, determine the mean and covariance functions of the model, and demonstrate its applicability in neuronal modeling.

The work of Balashova et al. focuses on a continuous-time symmetric branching random walk on the d -dimensional lattice. Assuming that there exists one particle at every lattice point at time $t=0$, they study the particle subpopulation structure generated by the initial particle situated at a lattice point x .

Bulinskaya and Shigida present theoretical results and an algorithm to calculate ultimate and finite-time ruin probabilities in a periodic-review insurance model; some dividends problems are also considered.

Bulinski and Kozevin establish asymptotic unbiasedness and L2-consistency for various statistical estimates of mutual information in the mixed models' framework; their contribution provides important properties in analyzing medical and biological data.

Common shock models are extremely useful tools for many applications in reliability theory, insurance, and risk management, and also represent specific dependence structure models; their extension is studied in the paper of Cherubini et al.

Dafnis et al. study the distributions of families of patterns that generalize runs and patterns distributions, with an application related to patients' weaning from mechanical ventilation.

Santis et al. obtain convenient formulas for the probability distributions of minima-related variables when dealing with non-negative random variables with absolutely continuous joint distributions; in their study, the set of the multivariate conditional hazard rate functions are employed as a convenient method to describe different aspects of stochastic dependence.

The time evolution of a lattice branching random walk model with local perturbations is the subject of Feng et al.'s work; stability and instability issues of the model's steady states are studied.

Foschi develops a measure of discrepancy between Poisson and exponential Hawkes processes.

Hijazy and Zemleni propose a new approach for disease progression by a gamma degradation process with a random starting point and get estimates of the gamma process parameters, screening sensitivity, sojourn time, and lead time.

A numerical stochastic model of the high-resolution time series of wind chill index, considered in Kargapolova's paper, permits to conclude on some statistical properties of rare and adverse weather events.

Kim et al. derive a simple and complete solution for deriving the distributions of queue lengths at different observation epochs for the GIX/Geo/c/N model. They also indicate how their method can be used to study queues with heavy-tailed inter-batch-arrival time distributions.

Kubkowski and Mielniczuk's work focuses on the asymptotic distribution of the empirical estimate of Interaction Information, one of the most promising interaction strength measures. Their derivation relies on the study of the asymptotic covariance matrix structure and its eigenvalues.

Insurance-related applications include Lefèvre and Simon's paper on ruin probability assessment under specific dependence models, with application to ruin probabilities.

The dependence structure of stock prices is the focus in Markus and Kumar's paper, where stochastically correlated Brownian motions drive the stochastic differential equations. Building and fitting stochastic volatility models this way, the authors obtain realistic tail dependence and copulas in the application.

Mukhopadhyay's review paper on Rereading Stein's Lemma illustrates a number of penetrating intricacies and their inherent beauty as well as noble simplicity to a broader audience, helping them gain valuable appreciations for Stein's Identity.

Silvestrov et al. present a detailed perturbation analysis of regularly and singularly perturbed Markov chains with damping components. They provide, among others, upper bounds and asymptotic expansions for approximating stationary distributions with respect to damping parameters.

Hawkes processes, important objects in describing the limit order book in mathematical finance, are the subject of Swishchuk's paper, which proves a functional limit theorem for compound Hawkes processes with or without regime-switching.

Finally, Wu and Glaz study the performance of a moving medians based scan statistic for testing a local change in the population mean. Their work addresses the problem in the case of normal data with unknown variance with the presence of outliers.

We are sincerely grateful to Professor Joseph Glaz (Founder and Editor in Chief of MCAP) for his generous help and attention in setting up this issue. Our thanks go to our colleagues, who have submitted excellent articles. We are also thankful to the unanimous reviewers, whose honest, thorough, and thoughtful work has provided a critical and solid background for achieving the very high quality of the papers published in the present special issue.

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