Editorial

The first paper in this issue of ORiON is by Vosloo and Joubert with the title "Development of a map-matching algorithm for dynamic-sampling-rate GPS signals to determine vehicle routes on a MATSim network". The authors highlight the need for accurate and efficient map-matching algorithms for deriving vehicle routes from GPS data points that are recorded in chronological order. By decreasing the rate at which GPS points are stored, data storage costs may be reduced, but at the expense of accuracy when attempting to compute the original routes. The proposed solution involves the application of spatial and temporal analyses to produce a so-called candidate graph of GPS points. By employing Dijkstra's algorithm, routes are calculated that maximise the probability that the object traversed the solution path. Computational results are based on both a simple grid network and a real network of the city of Cape Town, South Africa.

The second paper in this issue by Visagie and Grobler is titled "On the discrepancy between the objective and risk-neutral densities in the pricing of European options". This paper discusses the surprisingly large difference between the probability measure used for the calculation of option prices and the probability measure governing the evolution of the underlying stock price. The authors contrast the sophisticated mathematical theory that has been developed in the context of option pricing to the simplistic approach often associated with practical implementation. The paper shows numerically that the use of the two methods mentioned can result in very different fitted financial models. A method is also proposed to unify the two approaches.

The authors of the third paper in this issue are Movius and van Vuuren, and the title of their article is "Self-organisation in traffic signal control algorithms under light traffic conditions". In this paper, the authors compare the performance of five existing self-organising traffic signal control strategies and an existing fixed-control strategy. Algorithmic details of each of these strategies are provided as well as suggestions on how to improve on the performance of three of these strategies. An important contribution of this paper is the introduction of a microscopic traffic simulation model, which was used as an algorithmic testbed, as well as a self-organising, adaptive algorithm that clusters vehicles into so-called platoons. Computational results suggest the implementation of the newly proposed control for light traffic conditions, while the existing fixed-control be considered for heavy congested traffic.

I want to convey my sincerest thanks to Susan Campher, the ORiON journal manager, and to Zander Labuschagne, our typesetting assistant, for all the effort in preparing this issue of ORiON. The editorial team would like to thank the referees for their invaluable contributions during the review process as well as the authors for submitting their scholarly work to ORiON.

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June 2019