



What if the Covid-19 Pandemic Never Happened? Estimation of the Tourist Arrivals for 2020 Via Levenberg-Marquardt Optimization and K-Star (K*) Machine Learning Algorithms

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Article History

Received: 29.02.2024

Accepted: 27.03.2024

Keywords

Artificial intelligence

Machine learning

Levenberg-Marquardt Optimization

K* algorithm

Abstract

Based on the probability theory, which is used to model uncertainty and randomness in real-world situations, the study aims to understand the impact of uncertain conditions, such as the Covid-19 pandemic, on the accuracy of the algorithms and the resulting losses to a country's tourism industry. The contribution of this paper to the international body of knowledge is twofold: firstly, it advances theoretical understanding of the use of probability theory in modelling real-world problems; and secondly, it offers a methodological approach for estimating tourist arrivals that accounts for the impact of extreme events. To achieve these aims, the Levenberg-Marquardt optimization was first applied to determine the optimal coefficients of the exponential function for estimating tourist arrivals from 1950 to 2020. Next, the K-Star machine learning algorithm was applied to the dataset with and without Covid-19 cases to estimate tourist arrivals.

Article Type

Research Article

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