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Journal of Tourism & Hospitality

Perspective

The COVID-19 Pandeic and Tourist forecasting Coetition

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DESCRIPTION

The ongoing COVID-19 pandemic has significantly impacted the travel and tourism sector. It is unclear when the tourist industry will rebound. Strategic planning by tourist destinations and enterprises involved in the tourism industry depends on accurate forecasting of the entire scope of the impact on the tourism industry and market recovery. In consideration of this, a competition for tourism forecasting was requested by the curated collection of annals of tourist behavior on tourism forecasting for July 2020. Three competing teams, representing Asia and the Pacific, Europe, and Africa, were established by 19 tourism studies from all over the world. This unique collection contains their opinions on the predicting outcomes.

It should be noted that only one organized tourism forecasting competition has occurred. In that competition, only two teams competed, one focusing on econometric methods and the other on time series forecasting. There had been no forecasting competition focusing on tourism recovery from a global emergency. As a result, the current competition filled a gap in the tourism forecasting.

The competition had two main goals: To advance tourism forecasting technique and contribute to the development of this field of study; and to inform the tourism industry and destination management and marketing organizations about good forecasting practice and the predicted impact of the COVID-19 pandemic on tourism.

Forecasting for these two purposes occurred in two stages

Stage 1: Ex-post tourism demand forecasting prior to COVID-19. Based on data collected through the end of 2018, each participating team forecasted tourism demand in 20 specific destinations across all regions for 2019. In "normal" times, the goal of stage 1 forecasting was to identify the most accurate forecasting method.

Stage 2: Forecasting tourism demand before and after COVID-19. Each team forecasted tourism demand in the 20 destinations through the end of 2021 based on the most recent available data. In a crisis situation, the goal of stage 2 forecasting was to identify the most accurate forecasting method and procedures.

In comparison to the first tourism forecasting competition a decade ago, the current competition featured a greater number of forecasting that were more varied and advanced. In the first competition, only five non-causal time-series forecasts and three types of causal econometric models were included; in the current competition, all three teams included artificial intelligence methods, such as neural network, random forest, support vector machine, extreme learning machine, and multilayer perceptron methods, in addition to the time-series and econometric models mentioned above. Furthermore, the Europe team used hybrid models that combined the benefits of time-series and artificial intelligence methods, as well as combination forecasting; the Africa team used hierarchical forecasting that took into account both cross-sectional and temporal aggregations. Among the many forecasting used for stage 1 forecasting, the Asia and Pacific team's stacking model based on five time-series methods provided the most accurate ex post forecasts overall, The Asia and Pacific team thus prevailed in the stage 1 competition.

Based on MASE values across all forecasting horizons and all origin-destination pairs, the Asia and Pacific team's stacking model was approximately 22% more accurate overall than the benchmark seasonal naive model. In one-quarter-ahead forecasting, the stacking model outperformed the other teams' best-performing models, and the performance of the three best methods tended to converge as the forecasting horizon extended further. The Europe team, for example, developed a COVID-19 Risk Exposure index to aid scenario forecasting. In comparison to the level in 2019, the three teams presented slightly different rates of tourism recovery in 2021 among the 20 destinations. Although the accuracy of stage 2 forecasts has yet to be determined and the overall winner of this competition are unknown, all participating teams have made significant contributions to tourism forecasting and practice by recommending innovative frameworks for tourism forecasting during an emergency.

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Received: 01-Jun -2022, Manuscript No. JTH-22-19732; **Editor assigned:** 03-Jun-2022, PreQC No. JTH-22-19732 (PQ); **Reviewed:** 17- Jun-2022, QC No. JTH-22-19732; **Revised:** 24-Jun -2022, Manuscript No.JTH-22-19732; **Published:** 01- Jul-2022, DOI:10.35248/2167-0269.22.11.515.

Citation: Kumar P (2022) The COVID-19 Pandemic and Tourist forecasting Competition. J Tourism Hospit.11:515.