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Proactive Spatiotemporal Resource Allocation and Predictive Visual Analytics

A visual analytics tool uses advanced forecasting and spatial correlation techniques to provide decision-makers with predicted activity levels for optimizing resource allocation and deployment.

Many organizations often have to rely on decision makers with limited statistical knowledge for determining the allocation of goods and resources. Although the data used by the decision makers contains valuable information, extraction and visualization of the data is very complex and time consuming.

Researchers at Purdue University have developed a visual analytics approach that provides forecasted levels of activity to decision-makers. This forecasting technique is based on the Seasonal Trend Decomposition based on the loess method, which is applied in a spatiotemporal visual analytics context to provide analysts with predicted levels of future activity. Furthermore, a novel kernel density estimation technique is used, allowing the spatial correlation of recent incidents at nearby locations to influence the prediction process. This technology can assist decision makers in many venues including crime prevention, law enforcement, resource allocation, logistics and routing, and military.

Advantages:

-Provide a proactive and predictive environment for decision makers

-Minimize the amount of resources needed

-Optimize allocation and deployment of resources

Potential Applications:

-Forecasting

-Decision making tool

Technology ID

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Category

Artificial Intelligence & Machine Learning/Reinforcement & Federated Learning

Robotics & Automation/Autonomous Systems & Perception AI

Authors

David Ebert

Ross Maciejewski

Abish Malik

Sherry Towers

View online

-Crime prevention, law enforcement, resource allocation, logistics and routing, and military

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Intellectual Property:

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