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The Virtual Anticipation Network (VANE)

We exist in complex operational environments. Every activity spawns "ripples" of effects, and those effects spread between domains. Intersecting "ripples" magnify or suppress effects. Compounding those challenges are gaps and errors in data (like fake news) or signals hidden in complex formats. VANE provides clarity in complex, multi-domain environments.

Solution Brief. ↗

Why Vane?

How VANE provides clarity:

- **Automated-Machine Learning** to discover behaviors and relationships hidden in data without waiting for subject matter experts.
- **Tensor Completion** to deal with dirty data and multi-domain interactions.
- **Scenario Forecasting** to see future impacts, generate courses of action, and optimize plans.

VANE was designed and developed as an auto-ML forecasting and "what-if" impact analysis platform targeted at decision optimization. It uses robust machine learning techniques to accurately interpret "dirty data" through fusion of sources from multiple topic domains to improve forecast accuracy and create whole-of-environment models in support of automated scenario assessment. VANE's automation increases the agility of leaders seeking the likely impacts of decisions, tracks the progress towards future goals, and tips analysts on relationships in sensor data correlated with those outcomes.

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Tensor completion emanates from the math invented for quantum mechanics. It enables an automated computing environment in which the engine learns relationships across all dimensions. It facilitates the aggregation and conflation of more signals from sparse data and reduces the gaps typically encountered in traditional data collection methods. Through machine learning, the application can make independent predictions and/or improve downstream modeling. Additional data significantly improves the confidence level of the model results, and the engine learns from the outputs.

VANE uses a serverless, ephemeral, distributed architecture to reduce costs and elastically meet scaling requirements, periodically processing over 3 billion data points and training 27,000 models which supports on-demand near real-time assessment of hundreds of scenarios each month.

Initially, VANE focused on improving the ability of the US Army G2 (intelligence directorate) and combatant command Joint Intelligence Operations Centers to conduct anticipatory intelligence by reducing the labor required to monitor the operational environment and discern phenomena which will impact operations. These insights are now being integrated into US Army G3 (operations directorate) for joint information operations and force management.

BigBear.ai has implemented VANE to enable advanced information operations assessments for the Joint Staff and support to a myriad of other organizations across the federal space. With a current expansion into the information operations arena, VANE stands ready to provide information advantage and decision support via whole-of-environment situational awareness, time-series forecasting, future event warnings, and course of action impact analysis. VANE is on track to provide data-driven assessments across multiple domains and echelons, including grey-zone warfare, operations at the strategic and operational levels, information warfare, and more.

Talk to a BigBear.ai VANE expert today: GET STARTED ↗

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