Games may help train analysts to overcome bias

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Game-playing may help intelligence analysts with the serious business of identifying biases that can cloud decision-making and problem-solving during life or death situations, according to researchers.

Analytic exercises conducted by researchers at Raytheon that used scenario-based games designed by Col. Jacob Graham, senior research associate in the College of Information Sciences and Technology, Penn State, showed that some of the participants displayed anchoring and confirmation biases as they tried to determine responsibility and motivations for insurgent attacks in the scenario. Confirmation bias is the tendency to accept only information that supports current beliefs and attitudes, while anchoring leads people to overemphasize past judgments or initial hypotheses in spite of new, contradictory evidence.

"Biases are often difficult to identify, but it's important to recognize bias in decision theory and analysis," said Graham, who worked with Donald Kretz and B. J. Simpson, both cognitive scientists at Raytheon Intelligence and Information Systems. "For decision makers, biases can make the difference in life and death decisions."

The researchers said that the idea to use games as a way to detect confirmation bias was rooted in recent studies that implicated biases in number of national intelligence failures.

"There have been a lot of post-9/11 studies that looked at analytic tradecraft and intelligence failures," said Kretz. "What they found was

that there are a number of significant obstacles to good and thorough intelligence analysis, but what gets mentioned over and over in these studies is cognitive bias."

Graham designed a series of games based on real-life situations that U.S. intelligence analysts faced in Iraq. He used information from a collection of digital documents and reports that he developed to create decision-making games for analysts.

"It's fictional, but it's very real," said Graham. "We are very careful not to give up secrets on how the U.S. operates."

The researchers, who report their findings at the IEEE Conference on Technologies for Homeland Security, today (Nov. 13), said the games used a chain of messages, intercepted phone calls and intelligence reports that offered insights into the activities of insurgent groups in a poor area of Baghdad.

According to Kretz, three groups of nine participants, all engineers at Raytheon, were placed in the middle of an evolving scenario of a series of insurgent attacks. The subjects, who were college educated but not trained in intelligence analysis, had access evidence following each attack and were asked to assess responsibility and motivation after each attack occurred.

The first group analyzed the data by trying to understand the relationships between known and unknown groups of people—link analysis. Another group pulled information and weighed the importance of the data, called information extraction and weighting. Researchers briefed the final group on how to use competing hypothesis to explain reported insurgent acts. Creating alternative hypothesis is one way to avoid confirmation bias.

The team that trained in considering alternative hypotheses significantly outperformed the other teams when identifying the perpetrators and the intended targets, Kretz said.

"We created this exercise to allow analysts to scan through a series of messages and we were able to prove that they had a certain mindset," said Graham.

Kretz said the study could be used in the future as a way to train intelligence analysts to detect and minimize their biases, as well as develop smarter technology to support intelligence analysis.

"This is really about laying the foundation for creating exercises that we can run with working government analysts," said Kretz.

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