Ancient board game offers insight into military, cyber threats

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(Phys.org)—As the United States faces increasing cyber and physical threats, both foreign and domestic, intelligence analysts must be able to predict their adversaries' moves and defeat them at their own games. At Penn State's College of Information Sciences and Technology (IST), Stan Aungst is employing the ancient Chinese game of Go to help students gain new insight and new methods for countering attacks and to hone new cognitive skills for the 21st century.

"We're using the game as a training ground to think strategically and tactically," said Aungst, a senior lecturer for security and risk analysis (SRA) and senior research associate for the Network-Centric Cognition and Information Fusion Center.

The course that Aungst is teaching, "Using Serious Games to Promote Strategic Thinking and Analysis," introduces students to thinking visually about attacks, attack patterns, spatial analysis with individual performance evaluation via interactive virtual scenarios/missions and gaming.

Go is a board game for two players that originated in China more than 2,500 years ago and spread to Korea and Japan in about the 5th and 7th centuries CE, respectively. The two players alternately place black and white playing pieces, called "stones," on the vacant intersections (called "points") of a grid of 19X19 lines. The object of the game is to use one's stones to surround a larger total area of the board than the opponent. Once placed on the board, stones may not be moved, but stones are

removed from the board if captured. When a game concludes, the controlled points (territory) are counted along with captured stones to determine who has more points. Games may also be won by resignation.

"It's an extremely abstract strategy game," said Paul Wright, coordinator of the Schlow Library Go Club, who recently demonstrated the game for the students in the class.

John Hill, a lecturer at the College of IST who is assisting Aungst with the course, said that the class is a "significant departure" from any other courses that the college has offered.

"During the course, Go is used as the means for analyzing widely divergent problems, and for developing effective tactics and strategies to address those problems by means of conversion rather than elimination," Hill said.

"We're trying to relate the thinking and strategy in this game to real-life situations," said Jacob Sisko, a sophomore majoring in SRA who is enrolled in the course. "Part of it is trying to guess your opponent's next move."

Joe Cho, a sophomore SRA major who is also in the class, said the objective of the Go game is "more about efficiency" than other board games such as chess, since the goal is to capture territory using as few "stones" as possible.

"The lessons are more applicable to today's military situation," he said.

Todd Bacastow, a professor in the College of Earth and Mineral Sciences (EMS) who collaborated with Aungst in developing the course, said he has been a "proponent for using serious games at Penn State as a means to help the student learn for years."

"My specific interests are using games to teach intelligence analysts," Bacastow said. "Gaming technologies are replacing traditional methods of training in the U.S. Intelligence Community (IC). The Defense Intelligence Agency's (DIA) VISim (Virtual Intelligence Simulation) is an example of a serious game. VISim's expressed goal is to prepare the next generation of intelligence professionals who are attuned to video games."

Ken Schroyer, a project manager for Administrative Information Services (AIS) at Penn State, who helped Aungst in developing the course concepts, said that the Go game epitomizes the Eastern strategic mindset. In the West, he added, chess is widely regarded as the ultimate strategy game. For its Eastern counterpart, Go, it is not necessary to "kill" opponents to capture territory.

"We use the concept to measure the ability of analysts to understand Eastern cultures," he said.

A test will be used to measure individuals' ability to predict cyber and physical attacks. About 100 intelligence analysts have taken the test, Aungst said. After the students in the "Go" class take the test, he added, their scores will be compared to the students who took the test last year.

"I'm preparing them to take this real-world test," he said.

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