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AI Helps Prevent Poaching

Fri, 04/22/2016 - 10:13am

by Greg Watry, Digital Reporter

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Once found throughout sub-Saharan Africa, black rhinos were in decline by the end of the 1960s. According to the World Wide Fund for Nature, an estimated 70,000 were alive on the continent by the end of that decade. But poaching set the population on an even further downward spiral. By 1993, a little more than 2,400 black rhinos were recorded.

To combat poaching, human patrols comb through large national parks, where endangered species are known to live. But humans alone can only do so much.

The National Science Foundation and the Army Research Office are helping researchers bolster patrols by using artificial intelligence (AI). The researchers are working with colleagues from the U.S., Singapore, the Netherlands, and Malaysia, led by Prof.



PAWS suggests patrol routes in Malaysia based on behavioral models. Source: Team leader from Rimba

Miling Tambe, who teaches computer science and industrial and systems engineering at the University of Southern California.

“In most parks, ranger patrols are poorly planned, reactive rather than pro-active, and habitual,” said researcher Fei Fang, of USC, in a statement.



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Called Protection Assistant for Wildlife Security (PAWS), the burgeoning AI system is built on game theory. According to the National Science Foundation, “game theory uses mathematical and computer models of conflict and cooperation between rational decision-makers to predict the behavior of adversaries and plan optimal approaches to containment.”

Using previous patrol data and poaching incidences, PAWS plans patrol routes that it continuously modifies as more data is received. Capable of integrating terrain information, the system can design patrol routes that save time and energy, and ones that account for an animal’s natural transit path. This creates a so-called “street map.”

Recently, the team combined the system with another tool, the Comprehensive Anti-Poaching Tool with Temporal and Observation Uncertainty Reasoning (CAPTURE), meant to predict poaching attacks.

Findings from tests of the systems are slated for presentation at the 15th International Conference on Autonomous Agents and Multi-agent Systems, held in May.

“This research is a step in demonstrating that AI can have a really significant positive impact on society and allows us to assist humanity in solving some of the major challenges we face,” said Tambe in a statement.

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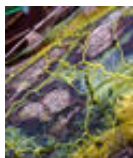
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