

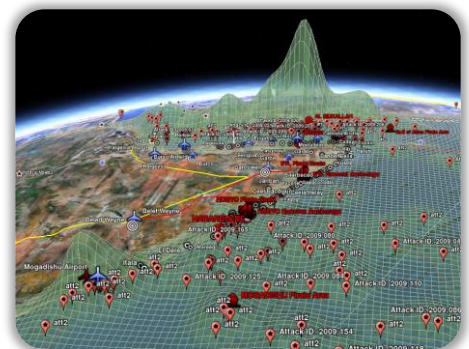
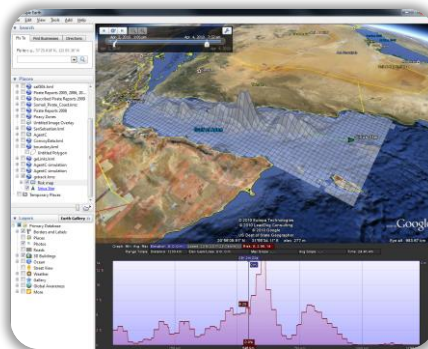
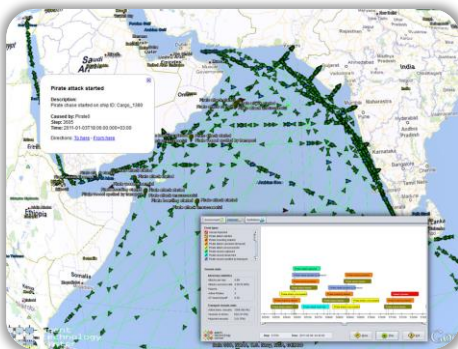
# Simulation of Illegal Maritime Activities – Business Case Description

## Blindspot Solutions, Czech Republic

### Problem Overview

Today's high seas are filled with a number of illegal activities including illegal fishing, waste dumping, maritime piracy, drug smuggling, human trafficking and others. A number of activities, such as allocation of naval assets, periodical evaluations of countermeasures' efficiency, and forecasting of next season activities are strenuous tasks for many involved stakeholders. To make time-efficient and effective decisions, a decision-support and training tools are required.

We provide a state-of-the-art agent-based simulation of the illegal maritime activities to provide a necessary platform to conduct a number of various what-if analyses, to evaluate efficiency of asset deployment and impact of countermeasures deployed. We enhance the platform with data analysis and a visualization module to provide insights into various trends and to help to discover patterns and modes of operations of the adversaries. Finally, the tool can be used as a training scenario execution platform, allowing to simulate a wide range of predefined scripted scenarios while training operators and decision-makers to react precisely, optimally and constructively.



### What-if analysis

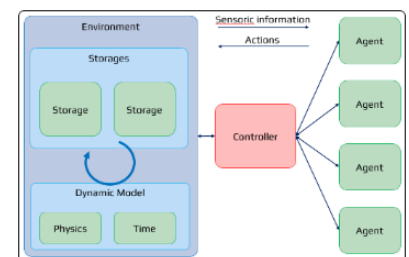
Using our state-of-the-art multi-agent simulation and unique behavior modeling framework, we are able to change a number of parameters which currently hold to conduct a what-if analysis, including definition of a level of uncertainty in the parameters. The following what-if analyses can be performed:

Relocation of illegal activities

Modification of maritime traffic schemes

Multiplication of antagonist's resources

Introduction of a specific maritime countermeasure



Simulation of drug smuggling activities:

<http://blindspot-solutions.com/projects/bandit>

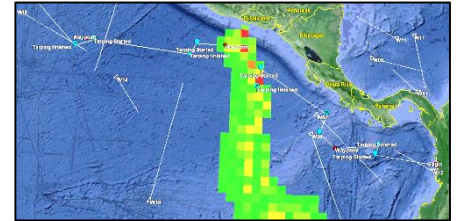
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## Data analysis and visualization of illegal activities

If data provided, we are able to analyze the data to find patterns, clusters and trends which can be subsequently used to decide about efficient countermeasures. We used advance geospatial visualization tools to display progress of activities in time and present data in human-readable form. Following analyses can be performed:

Definition of modus operandi of antagonists in different regions and time of the year

Analysis of the area the of influence, visualization of spatial and temporal shifts of activities or adaptation to countermeasures



Analysis and modeling of maritime piracy in the Indian Ocean:

<http://agents.felk.cvut.cz/projects/agentc>

## Training of countering organizations and agencies

A simulation can be executed in real-time to simulate an incident described by the client in a predefined scenario. The simulation controls the progress of the scenario, informs the trainees about the development of the situation and shows them information collected so far. On the other side, the master screen reveals all information about the scenario to the trainer. Suggested actions of the trainees are provided as the input to the simulation which evaluates their impact. Following scenarios can be executed:

Terrorist or security incident	Hijacked tanker aiming to crash into a harbor
	Hijacked tourist ship requiring ransom and killing hostages every hour
Search and Rescue	Airplane crash on an unknown location
	Illegal fishing vessel sending SOS signal in a storm
Drone-based surveillance	Drug smuggling operation interdiction
	Illegal immigrant rescue

Blindspot Solutions is able to customize the developed simulation core for any maritime activity and extend the environment model to account for Automated Identification Systems, Unmanned Aerial Vehicles etc. We are able to develop customized behavior models as described by subject-matter experts and we are able to deploy the simulation on site or provide access remotely, executing scenarios on our servers.

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