



MIDDLE EAST TECHNICAL UNIVERSITY

CENG 491

Computer Engineering Design

User Manual

Perimeter Search and Patrolling Using Limited Capacity
Unmanned Air Vehicles

Venture Co.

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1. General Information

1.1. Scope of the Document

This document was prepared by the developer team of MAB-UAVSS, Venture Co. The scope is the assistance supply to the users of the product MAB-UAVSS, explaining how to use the main functions of this simulation system. This manual covers the software and hardware parts of our product and explains how to correlate them. It also explains system requirements, installation procedure and setup process of the system.

1.2. Contact Us

For the detailed information, you can contact to any of us through e-mail:

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Or, you can visit our website for more information:

Website: <http://senior.ceng.metu.edu.tr/2012/ventureco/>

2. Installation

2.1. System Requirements

2.1.1 Software Requirements

1. Java SDK and JRE
2. Integrated development environment (Eclipse recommended)



2.1.2 Hardware Requirements

Although there is no exact requirements, the requirements below are recommended for users to use the simulation without any problems. Otherwise, they may use it with lower performances.

1. Pentium 4 or more Processor
2. Minimum 2-3 GB DDR2 Ram
3. 256 MB or more Graphics Card
4. At least 1 GB hard disk space

2.2.Setup

For the installation of the product, you just need to run the executable file given in the final package.

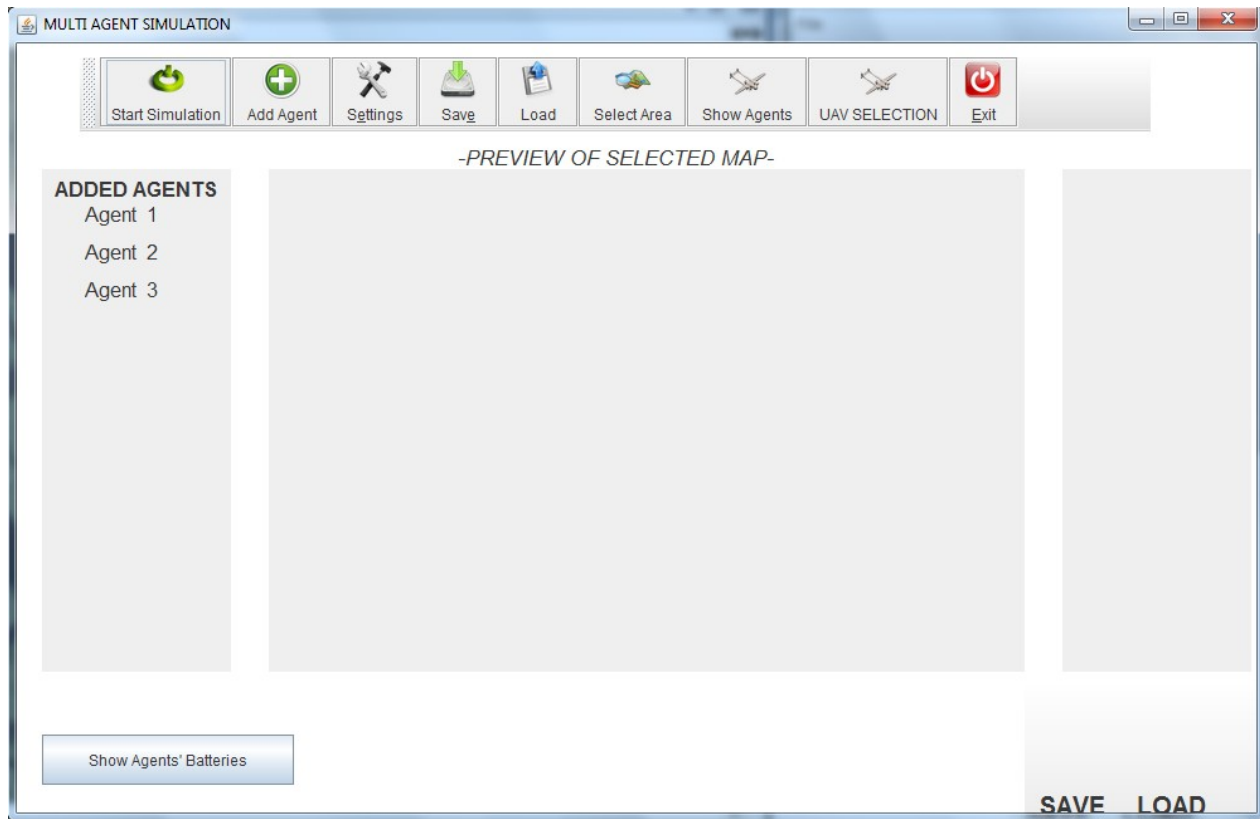
3.How to Use

3.1.System Features

The product offers the user to patrol a selected area with intelligent agents with user-specified properties. The user selects the area that wanted to be patrolled and creates any number of agents by entering communication range, sight range, maximum velocity, maximum height, battery life time and its initial position. When the user starts the simulation, the agents start patrolling the area and presents him a 2D visualization of the map and positions of the agents on the map. The procedure of how to use simulation is described detailed below with some screen-shots.

3.2. Running the Simulation

When the user runs executable file, the user interface welcomes him. There exist start simulation, add agents, settings, save, load, select area, show agents, uav selection buttons which execute the tasks as it is understood from their names. The opening screen can be seen as in picture1.



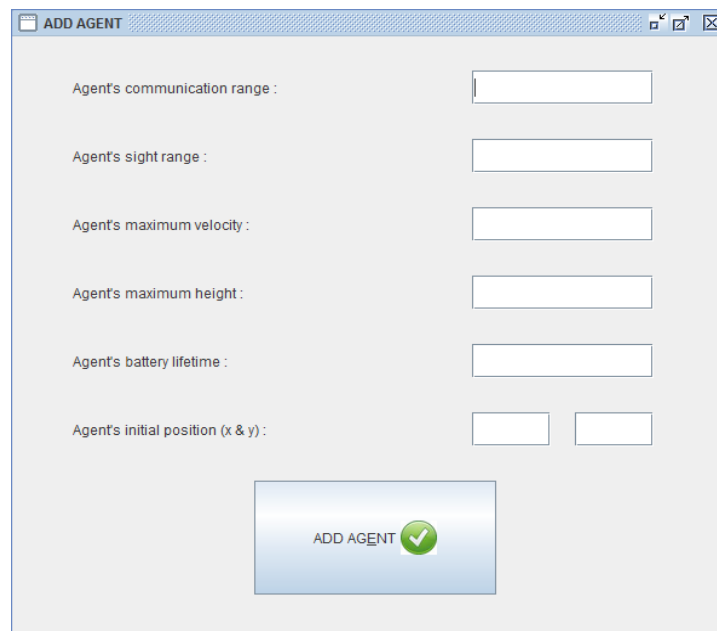
Picture 1. User Interface

At this point, the user is expected to select the area that is going to be patrolled. This action can be done by 'Select Area' button. After that, the area selection window is opened as in picture2. When the user clicks the start selection button, the program allows him to choose a region over the map. Pressing the finish selection button executes map selection and getting elevations process.



Picture 2. Map Selection Window

Now, the user is expected to create agents or select from the pre-defined list. 'Add Agent' button opens the screen in picture3 and gets the properties of the agent from the user.



The screenshot shows a software window titled "ADD AGENT". It contains the following input fields and labels:

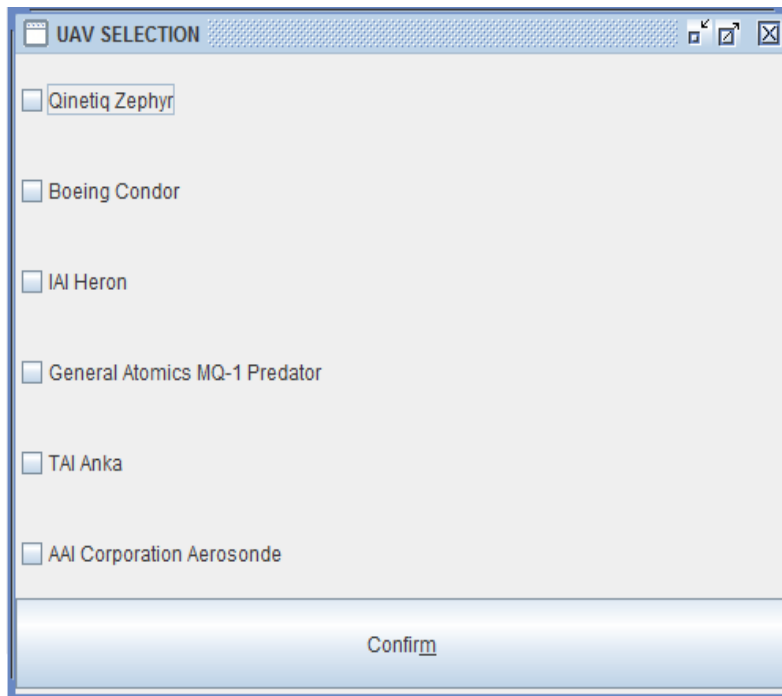
- Agent's communication range : [input field]
- Agent's sight range : [input field]
- Agent's maximum velocity : [input field]
- Agent's maximum height : [input field]
- Agent's battery lifetime : [input field]
- Agent's initial position (x & y) : [input field] [input field]

At the bottom center is a large button labeled "ADD AGENT" with a green checkmark icon.

Picture 3. Add Agent Window

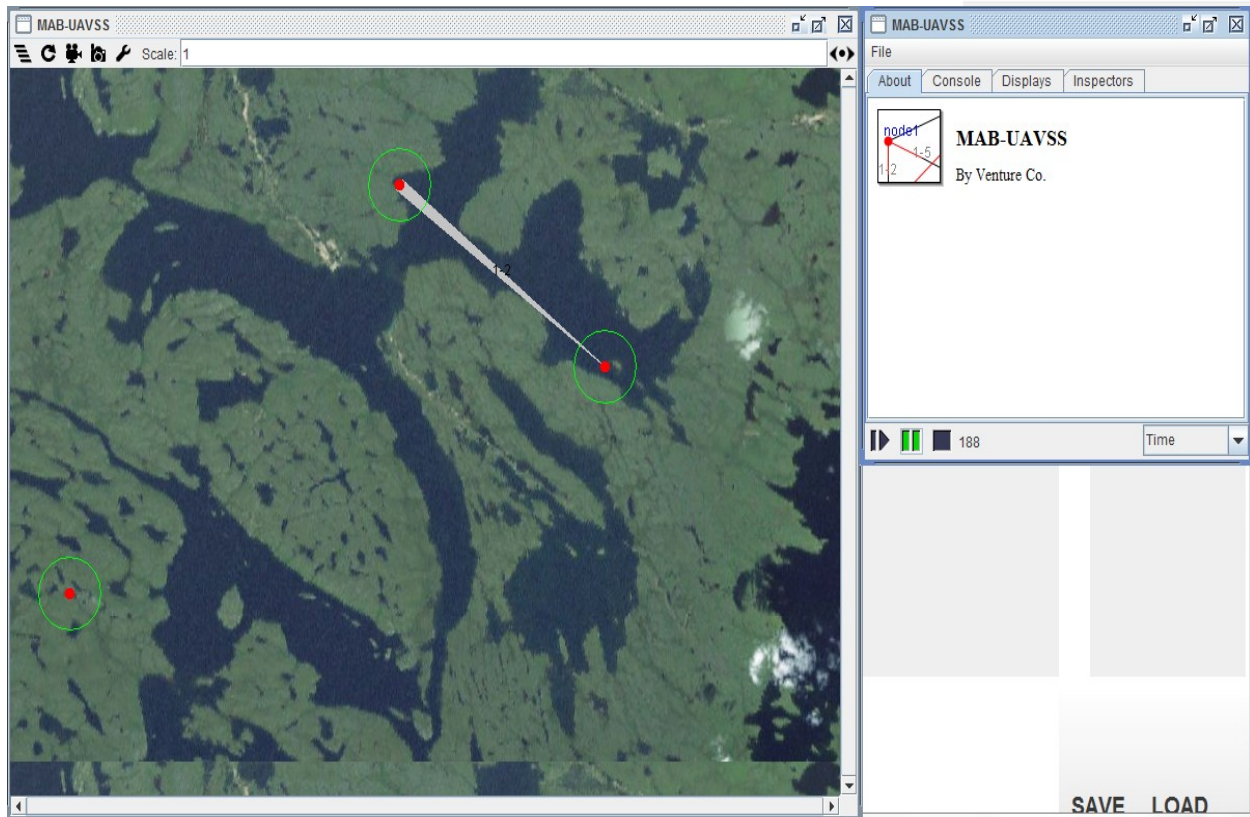


The user may not want to add any agents in some cases; instead, he may want to use pre-defined agents. Clicking the 'Uav Selection' button brings the window in picture4 that gives the user the chance of selection from the list.



Picture 4.Pre-defined Agents

After these steps, the system is ready to be simulated. When clicking the 'Start Simulation' button, the simulation starts executing and a 2D visualization as in picture5 is presented to the user.



Picture 5.Simulation Screen

Besides these, the user can save and load the simulation by using the save/load button.

3.2.Troubleshooting

Our project is currently in the pre-beta phase. Therefore, facing with many bugs is quite possible. If you encounter a bug, the only advice we can offer is to simply avoid it and report the bug to us via e-mail.