

SB-MASE 1.2

Subsumption-based Multi-agent Simulation Environment

Overview of new features

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In this document, we present the changes made to the SB-MASE software in the version update from version 1.1 to version 1.2. For a complete overview of features, please consult the User Manual.

What's new in SB-MASE 1.2?

SB-MASE 1.2 was developed with three goals in mind:

- More features;
- More speed;
- More stability.

In order to achieve these goals, the following improvements were made:

- **Object-oriented simulator world definitions.** Using SB-MASE's new world definition format, users can define worlds with static and mobile, massive and flat, normal and light-emittant, rectangular and ellipsoid objects. Additionally, there is support for clusters of object distributed with a uniform or gaussian distribution within a defined area. World definitions can be edited in SB-MASE.
- **More, better and faster sensors.** The sensors available to users have been redesigned to match requirements better. Now, we have a sonar sensor (low-level object detection), an object sensor (high-level object detection), a compass (detecting the direction of North) and a light sensor (detecting distance from and direction of a certain light source). All sensors are configurable using a graphical sensor wizard. Most sensors use analytical distance measures to guarantee fast performance.
- **Sensor migration.** Agents that have been constructed in a world that contains different objects than the world currently loaded, can now be used in this world, because SB-MASE automatically detects conflicts and prompts the user in order to resolve them.
- **More stable simulator.** The simulator engine has been improved drastically in both stability and speed. The internal clock and the graphical representation have been separated. The new engine achieves 200 runs per second and 25 redraws per second on most modern computer systems, with graphical enhancements such as anti-aliasing and light source drawing fully enabled.
- **Graphical debugging.** It is now possible to display an agent's sensors on screen during the simulation process, enabling users to check and under-

stand the sensor values produced. The Monitor frame is now shown per default, enabling debugging using a monitor process in agents, or using the PRINT statement in programs.

- **Plug-in support.** SB-MASE now supports the addition of plug-ins. Agent model plug-ins can be added to enable the use of other agent architectures and various external agents. Process plug-ins can be used in the agents themselves, enabling possibilities for other process architectures than can be defined in the SB-MASE process language. Plug-ins are detected without any necessary restarts. Each plug-in can be enabled, configured or disabled from within the program.
- **Khepera module.** In addition to the ActivMedia AmigoBot plug-in shipped with version 1.1, we now also include a K-Team Khepera plug-in providing the same functionality.
- **Graphical robot server.** The robot server now has a graphical user interface that enables users to start, stop and restart the server at their convenience. The server still is platform-independent.
- **User interface improvements.** Literally every user interface element has been improved. The interface has a new style, tool windows such as the Task list can be docked and/or hidden, and processes in the Agent Editor are smaller so that more of them fit on screen.
- **Many minor bug fixes and additional features.** We literally reviewed every single line of code, removed numerous minor bugs and added many little additional features. Especially the language compiler that creates processes from source code, has been improved so that complex expressions are understood properly.
- **Improved program structure.** The internal structure has been improved drastically, enabling better and more extensive application development in future versions.

Important note

Due to the many changes on every level of the program, agents and worlds saved with previous versions cannot be opened in version 1.2. You are recommended to save the processes in your agents to text files and recreate agents. PNG format worlds used in previous versions cannot be opened in any way by version 1.2.