

# yaPOSH Action Selection

Jakub Gemrot, Jan Havlíček, Michal Bída, Rudolf Kadlec, and Cyril Brom

Faculty of Mathematics and Physics, Charles University in Prague,  
Malostranske namesti 25, 118 00, Prague 1, Czech Republic

**Abstract.** We present evolution of yaPOSH action selection system tailored for the development of intelligent virtual agents behaviors for the Unreal Tournament 2004 videogame. It was developed based on the data from the previous usability studies, in which we compared experiences of participants developing IVA behaviors in plain Java to those using Java+POSH.

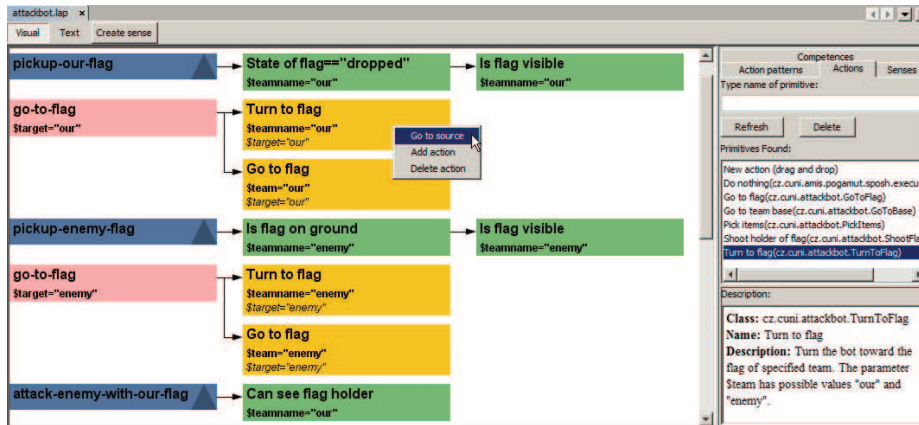
**Keywords:** Virtual agents, Action selection, Empirical studies, Tools.

## 1 Action Selection Matters

One of the key aspects of intelligent virtual agents (IVAs) is their ability to convey human or animal like behaviors; ability to act and react in human or animal like fashion. Those illusions of intelligent behaviors relate greatly to the graphical representation of IVA bodies and the smoothness of their animations. However, such behavior must also be contextually appropriate, which has to be supported by IVAs hidden-to-user robust action-selection (AS).

In last four years we have started to address the issue of AS systems comparison systematically. We have been running a course on IVAs development for computer science students at Charles University in Prague since 2005. Since the academic year 2009/10 we have been conducting scientific experiments as part of the final exam for the course, in which students are creating IVA behaviors for game-like scenarios. The data collected are used to drive improvements of the AS system students are working with; yaPOSH (dialect of POSH AS system [1]). yaPOSH AS system can be seen as an implementation of Behavior Trees [2] or decision trees. Results of our two studies can be found in [3, 4].

Concerning behavior-tree-like tools we have found out, and improved yaPOSH AS system accordingly that: 1) all tree nodes must be parameterizable to spare user of creating duplicate branches that differ only in one or few parameters used in leafs (actions and senses) and to help the overall reusability of created sub-trees, 2) AS system must recognize at least three return values from IVA action; FINISHED (an action has been finished successfully), RUNNING (an IVA's action is still being executed within the environment), FAILED (an action execution has failed), 3) tree editor must be tightly coupled with the editor of IVA behavior primitives (actions and senses), so it does not slow user down, 4) AS system needs to be accompanied with online debugger, that helps user to understand decisions made by the system during runtime.



**Fig. 1.** The screenshot from the yaPOSH plan graphical editor displaying the example part of the plan for the UT2004 IVA capable of playing capture-the-flag game

The yaPOSH AS system brings academic tools closer to the gaming industry, where such tools are commonly used during the production. We are also experimenting with this system in the context of AAA game title that is being commercially developed by WarHorse studio inc. using CryEngine. The yaPOSH AS system can be downloaded as the part of Pogamut platform [5].

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