

# ForceBot Building for AIIDE

ForceBot is a multi-agent StarCraft AI written using GOAL. I would like to make clear that neither GOAL<sup>[1]</sup>, nor the StarCraft GOAL Connector<sup>[2]</sup>, nor the StarCraft GOAL AI Wrapper<sup>[3]</sup> are created by me, although I am in close contact with its developers. All of these projects are open source. These are external libraries, and there is no need to compile them. If you truly wish to do so, additional instructions could be submitted.

Furthermore, as the source code is parsed on startup, and has a backbone that relies on Java, there is no actual ‘compiling’. The only real prerequisite is that Java 7 or greater 32-bit JDK is installed (and added to the PATH). The steps in this document merely detail how to generate the exact files that are included in the submission, but there is no practical benefit.

The pre-built version included in the submission should without problem given that its folders are placed in ‘C:\Starcraft\bwapi-data’.

## Prerequisites

1. Java 7 or greater 32-bit JDK<sup>[4]</sup>. The link leads to the archive versions of Java 7 as I understand that it will run on Windows XP. Please feel free to download Java 8 otherwise.
2. (for building only) Apache Maven<sup>[5]</sup>. Please follow the install instructions on their website.
3. (for building only) A clone of the ‘develop’ branch of the StarcraftGOALAIwrapper project on GitHub<sup>[3]</sup>. The version used to compile the version sent has been included in the ZIP file.

## Build Steps

1. Ensure that the Java bin directory and the Maven directory have been added to your PATH.
2. Place the ‘ForceBot-source.zip’, included in the submission, in the ‘StarcraftGOALAI-wrapper’ folder.

3. Execute the 'commands.bat' file either through 'commands.bat ForceBot-source.zip' in the command line, or by double clicking it and supplying the 'ForceBot-source.zip' filename when requested. Maven will automatically download the latest binaries for GOAL and any other external libraries.
4. Upon completion a new 'ForceBot-source.zip' file will be generated in the 'tournamentBots' folder. Extract the contents. It will extract the 'read', 'write' and 'AI' folders. Navigate into the 'AI' folder.
5. Copy the 3.7.4 (or 3.7.5) 'BWAPI.dll' file into the 'AI' folder. The bot could now be run, however to avoid possible complications and achieve the exact same binaries as the one submitted to you, please follow the additional steps below. Furthermore, please consult the JVM Settings section for what to do with the 'run\_proxy.bat' file.

## Additional Steps

1. Execute the 'starcraftgoalaiwrapper-0.0.2-SNAPSHOT-shaded.jar' file once. It will generate a 'swi' and a 'Bot' folder. The 'Bot' folder contains the source code of the agent, as well as the StarCraft GOAL Connector. The 'swi' contains the SWI Prolog 7 files for your operating system (the folder inside it should be called 'win32'). Once these files have been extracted, you may wish to close 'javaw.exe' through the task manager, if it hasn't done so itself.
2. You can open 'starcraftgoalaiwrapper-0.0.2-SNAPSHOT-shaded.jar' with a zipping program of your choice (such as WinRAR<sup>[6]</sup>) and remove the 'Bot.zip' file in the main directory, as well as the 'linux.zip', 'mac.zip', 'win32.zip' and 'win64.zip' files in the 'swiprolog' directory. This will reduce the size of the JAR file from about 26 to 6 MB and prevent any attempts to replace the existing code.

## JVM Settings

The default Java settings can be rather poor for the AI. Running the JAR with arguments to increase the heap size is preferred. The earlier mentioned 'run\_proxy.bat' allots a greater heap size to the JVM (the maximum that our test PC allowed). I'm unsure in which manner the bots are normally ran, but either using the 'run\_proxy.bat' file, or having your own system use similar arguments would be good. If you wish, you may delete the 'run\_proxy.bat' file.

## Final Note

I am including this note due to the submission email mentioning Windows XP. I've been told that BWAPI 4.1.2 and 4.2.0 bots often don't run on XP, so it seems unlikely that XP is actually used.

However, in case Windows XP is used after all, you will need to use the master branch of the 'StarCraft GOAL AI Wrapper' instead, which uses SWI Prolog 6 instead of 7 (6 being slower). Supposedly Java 8 works fine on XP despite being unsupported. In case it doesn't, I have saved you the effort of finding the archive link for Java 7:

<http://www.oracle.com/technetwork/java/javase/downloads/java-archive-downloads-javase7-521261.html>.

## References

- [1] GOAL <https://goalapl.atlassian.net/wiki/>
- [2] StarCraft GOAL Connector <https://github.com/eishub/Starcraft>
- [3] StarcraftGOALAIwrapper <https://github.com/Venorcis/StarcraftGOALAIwrapper/tree/develop>
- [4] Java <http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>
- [5] Maven <https://maven.apache.org/>
- [6] WinRAR <http://www.rarlab.com/download.htm>