

Installation Guide

Required Software

The setup of the HolMatica tool involves installing the following required software tools and libraries described below in Table 1.

Required Software	Version	Role
Mathematica	9.0	Computer Algebra System
OCaml	3.09.0	Programming Language
HOL Light	2.20	Theorem Prover System
XML-Light	2.0	Library written in Ocaml for printing/reading XML file

Table 1. The Required Software for the Implementation

The Installation Tool

The setting up of the tool involves the installation of the required software mentioned above. All of our code and files are public and can be downloaded from the web site <http://hvg.ece.concordia.ca/research/tools/holmatica/>.

In the following we present the steps to install and run an example:

Step 1: Extract the compressed file: "HolLight-Mathematica.zip" in the HOL Light directory.

Step 2: Load the HOL Light library by calling the “hol.ml” within OCaml session as described in Figure 1.

```
$ ocaml
      Objective Caml version 3.09.0

# #use "hol.ml";;
```

Figure 1. HOL Light Session

Step 3: Load the principle OCaml library of the tool by calling the “main.ml”, as described in Figure 2.

```
      Camlp4 Parsing version 3.09.0

# #use "main.ml";;
```

Figure 2. Main Program Function

Step 4: Type the HOL Light input statement which calls the main function “call_mathematica” that accepts the HOL Light expression and the Mathematica function.

```
# call_mathematica "real_integral (real_interval [&1,&10])
                  (\x. (x + &1))" "FullSimplify";;
```

Figure 3. HOL Light Expression of Computing Real Integral

Step 5: The Mathematica service dialogue window appears. The user specifies the name of the host machine where Mathematica is installed and the path to the Mathematica kernel as shown in Figure 4:

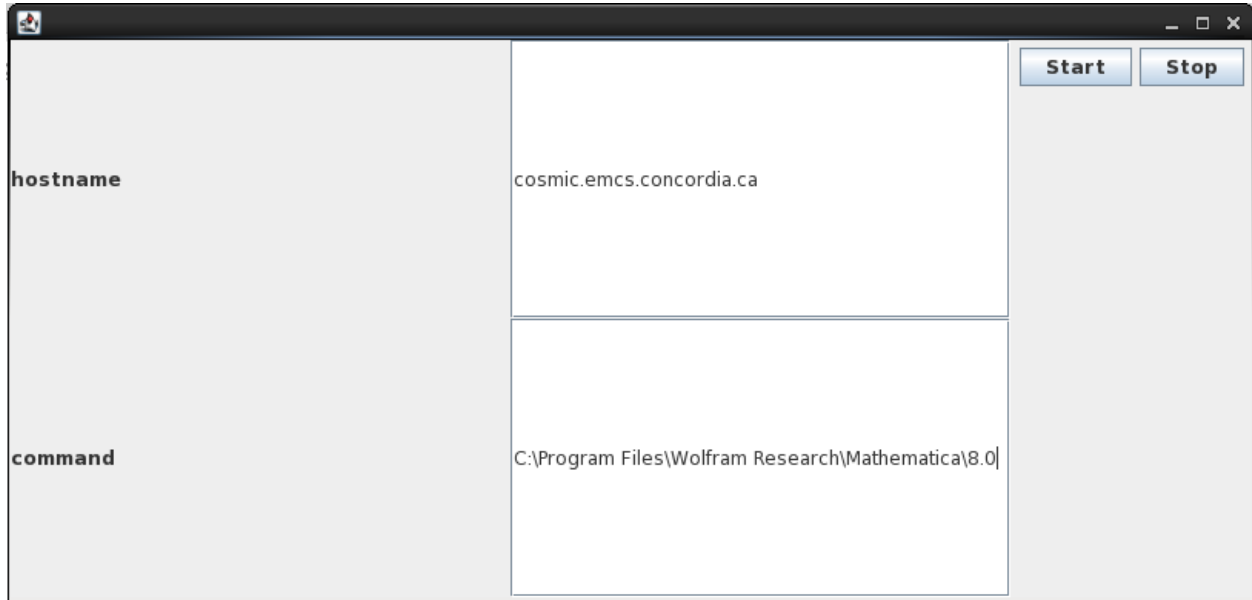


Figure 4. Mathematica Service

Step 6: After launching the Mathematica service, we get the computed result in the console as described in Figure 5.

```
# call_mathematica "real_integral (real_interval [&1,&10])  
  (\x. (x + &1))" "FullSimplify";;  
  
val it : thm = Mathematica  
  |- real_integral (real_interval [&1,&10])  
    (\x. x + &1) = &117 / &2
```

Figure 5. HOL Light Result after Computation by Mathematica

All the running examples that can handle HolMatica tool can be found in the file `running_examples`.