



## MoDeST, MoTor and Möbius

This document provides a short description of MoDeST, MoToR and Möbius. The document is also appended with a step-by-step instruction to install Möbius and MoTor tools.

### MoDeST (MOdeling and DEscription Language for Stochastic Timed system)

MoDeST is a modeling language for describing the behavior of discrete event systems. It combines conventional programming constructs such as iteration, alternatives, atomic statements, and exception handling with means to describe complex systems in a compositional manner. MoDeST also incorporates means to describe important phenomena such as non-determinism, probabilistic branching, and hard real-time as well as soft real-time aspects. MoDeST covers a very broad spectrum of modeling concepts, possesses a rigid, process-algebra style semantics, yet provides modern and flexible specification constructs.

### MoTor (MoDeST Tool environment)

MoTor is a tool-suite that supports the modeling and analysis of MoDeST specification. It is developed in Formal Method and Tools Group at the University of Twente. Currently, MoTor has two backends: the first provides a basic First State Next State interface in order to gain access to the global state space of the specification; and the second for generating modules for the Möbius modeling environment. Via the latter it is possible to do discrete event simulation of MoDeST specifications.

For more information on MoTor as well as to obtain the documentation of MoDeST language, you can access the MoTor web site at: <http://fmt.cs.utwente.nl/tools/motor/>

### Möbius

Möbius is a software tool for modeling the behavior of complex systems developed by Performability Engineering Research Group (PERFORM) at the University of Illinois at Urbana-Champaign. Möbius supports multiple high-level modeling formalisms and multiple solution techniques. Supported model types include stochastic extensions to Petri nets, Markov chains and extensions, and stochastic process algebras. Solution techniques such as simulation, state space exploration, and analytical solution are provided for analyzing models to study important behaviors of the systems being modeled.

For more information on Möbius as well as to obtain its manual, you can access the Möbius web site at: <http://www.mobius.uiuc.edu/>

### How to Install Möbius

- (a) Obtain the distribution (see the end of the document) and unzip it to a desired directory.
- (b) Go to the installation directory and run the shell-script file `setup` (`./setup`).
- (c) Follow the instruction. The installer will try to detect and locate your `g++`, `Make`, and `Tar` packages. If the installer cannot locate them, provide the appropriate locations. Afterwards, specify the directory to which Möbius is to be installed (`MOBIUSDIR`). The installation will proceed.
- (d) Run the Möbius from command line (`mobius &`).
- (e) Set the Möbius Project Directory from menu **Settings** → **Projects**.
- (f) Copy some examples from `MOBIUSDIR/examples` to the Möbius Project Directory.
- (g) Try one of the examples. To open the compressed example, you have to uncompress it first from menu **Project** → **Unarchive**.

- (h) After uncompressing an example you can open it from menu `Project` → `Resave`. This way it is opened and compiled simultaneously.

Note: It is assumed that you are installing Möbius in Linux OS equipped with XWindow environment. To install it in other OS's please consult the `README` file in the installation directory.

## How to Install MoToR

- (a) Obtain the distribution (see the end of the document) and unzip it to a desired directory.
- (b) Go to the installation directory (`MOTINSTDIR`) and run the shell-script file `configure` (`./configure`).
- (c) If the configuring of installation does not finish successfully, check the error messages. Most of the time the problem is related to Java installation in the OS and the `CLASSPATH` environment variable setting. In this case, please install Java Runtime Environment (JRE) in your system and set the `CLASSPATH` properly.
- (d) If the configuring does finish successfully, run (`make mobius`) to build the Möbius backend of MoTor.
- (e) Go to directory `MOTINSTDIR/backend/mobius` and run (`make install`).
- (f) Go to directory `MOTINSTDIR/backend/mobius/mobius-runtime-lib` and run (`make install`).
- (g) Go to directory `MOTINSTDIR/backend/mobius/mobius-editor` and run (`make install`).
- (h) If the last three steps do not succeed, you have to manually copy file `MOTINSTDIR/backend/mobius/momodest` to `MOBIUSDIR/bin/`; copy `MOTINSTDIR/backend/mobius/mobius-runtime-lib/lib/Linux_lib/*` to `MOBIUSDIR/Cpp/lib/Linux_lib/`; and copy file `MOTINSTDIR/backend/mobius/mobius-editor/Modest.jar` to `MOBIUSDIR/`.
- (i) Copy `MOTINSTDIR/backend/mobius/mobius-runtime-lib/*.h` to `MOBIUSDIR/Cpp/BaseClasses/Modest/`.
- (j) Edit `MOBIUSDIR/Cpp/BaseClasses/Modest/ModestModel.h` and `MOBIUSDIR/Cpp/BaseClasses/Modest/TTDReader.h`. Replace `#include "BaseClasses/*"` with `#include "../*"` in both files.
- (k) Edit file `~/.mobius/PMSettings` (if the file doesn't exist, run Möbius once), and add the following line:  

```
<string id=''InstalledModule''>Mobius.AtomicModels.MoDeST.MoDeSTInterface</string>
```
- (l) Copy an example from `MOTINSTDIR/tests/mobius/*` to the Möbius Project Directory and try to experiment with it.

Note: It is assumed that you are installing Möbius in Linux OS. To install it in other OS's please consult the `MOTINSTDIR/doc/install.txt` file in the installation directory.

To obtain the tools or if you encounter any problems while installing the tools please contact:

Reza Pulungan  
Building 45, Room 534  
pulungan@cs.uni-sb.de.