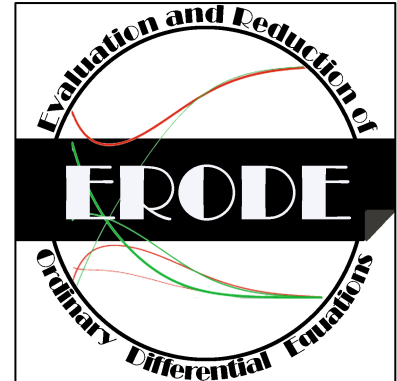


ERODE Quick Start

ERODE is a software tool for the solution and exact reduction of systems of ordinary differential equations (ODEs). It supports two recently introduced, complementary, equivalence relations over ODE variables: *forward differential equivalence* partitions ODE variables into blocks for which a self-consistent aggregate ODE system can be obtained; each aggregate ODE gives the cumulative dynamics of the sum of the original variables in the respective equivalence class. *Backward differential equivalence* identifies variables that have identical solutions whenever starting from the same initial conditions. ERODE uses a backend based on the well-known Z3 SMT solver <https://github.com/Z3Prover/z3> to compute the coarsest equivalence that refines a given initial partition. In the special case of ODEs with polynomial derivatives of degree at most two, it implements a more efficient partition-refinement algorithm.



Installation

ERODE is an Eclipse plug-in which depends on Microsoft's Z3 SMT solver as a backend engine.

1. Download Eclipse from <https://www.eclipse.org/downloads/>. We recommend using the Eclipse package "Eclipse IDE for Java and DSL Developers".
Note: we observed that, in general, the 32-bit version of Eclipse should be installed on 64-bit Windows machines.
2. Start Eclipse and install a new plugin as follows:
 - Click **Help** -> **Install New Software...**
 - Add a new update site by clicking the **Add...** button
 - In the **Add Repository** window, insert ERODE in the **Name** field and <https://dl.dropboxusercontent.com/u/18840437/it.imt.eroe.crn.updatesite/site.xml> in **Location**. Click **OK** to close the window.
 - Work with the ERODE update site, and select the ERODE feature.
 - Click **Finish**. Eclipse will download all necessary plugins. At the end of the installation process it will restart if required.
3. To install Z3, follow the simple instructions in the popup dialogue that opens the first time an ERODE program is executed (see below).

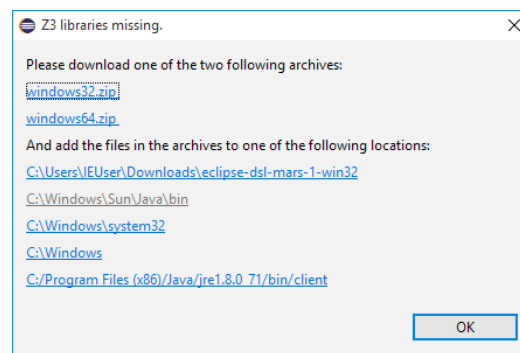
Using ERODE

ERODE recognizes files with extension ode found in a project in the Eclipse workspace. Projects and files can be created as follows:

1. First create a new project. **File** -> **New...** -> **Project...** and then choose **General** -> **Project** in the wizard. Choose project name and click **Finish**.

2. Right click on the project in the workspace and choose **New...** -> **Other**. Choose **ERODE** -> **ERODE file** and click **Next**.
3. Choose file name. The combo box gives the possibility of generating a basic template file with comments that illustrate various parts of the language. By clicking **Finish** the workspace will load the file with the ERODE text editor.
4. To run an ERODE program, click the ERODE icon in the toolbar. Alternatively, right-click the file in the workspace and click **Execute selected ERODE Program**.

The first time an ERODE program is executed, it will guide the user through the installation of the Z3 libraries (for Linux and Windows, on Mac this is not necessary). Choose the libraries according to your Eclipse environment (be careful about 32bit vs 64bit) and place them in one of the suggested directories. See screenshot for a Win10 with Eclipse Mars 32bit.



Example project

The archive file at <https://dl.dropboxusercontent.com/u/18840437/Examples.zip> contains an Eclipse project with examples. To import it, choose **File** -> **Import...** and select **Existing Projects into Workspace**. Click **Next**, select the archive file and tick **Copy projects into workspace**. Then hit **Finish**.