# SimFit

SIMULATION, FITTING, STATISTICS, AND PLOTTING.

# SimDem

SIMFIT LIBRARY FOR INPUT, OUTPUT, AND PLOTTING.

## Installation details

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https://simfit.uk
https://simfit.org.uk
https://simfit.silverfrost.com

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From Version 8.0.8 only the 64-bit version of SimFiT is distributed.
From Version 8.0.9 the simplified version sv_simfit is also installed.
Both are available from a desktop shortcut to
`C:\Program Files\simfit\bin\x64_simfit.exe`.

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## Contents

## 1 Advice before downloading

It is possible for malware to infect your computer when you open any file, especially installer *.exe files. So, after downloading such files, make sure your antivirus program scans the file and does not find anything suspicious before opening the file. To do this use your antivirus program and choose to scan your downloads folder. Of course this advice applies to any file you download from the internet.

if you get a UAC message when attempting to open a downloaded file it is from an unknown publisher then do not open it unless you have checked that it is free from malware.

## 2 Introduction

❍ The SimFiT package is designed for end-users who just want to do statistics, simulation, curve-fitting, and graphics. It is completely self–contained and runs out of the box, requiring no programming skills. The simplified version `sv_simfit.exe` has

fewer options and can be opened from `x64_simfit.exe`. It has been designed for inexperience users to practise with before using the full package.

❍ The SimDₑM package is intended for programmers who want to use the SimFɪT GUI to create true Windows programs instead of DOS-type console applications. It comes with a stand–alone driver program and documentation illustrating how to create messages, menus, tables, and graphics

❍ SimFɪT and SimDₑM are Open Source and free of charge to all users.

❍ The 32-bit versions of SimDₑM will run on either 32-bit or 64-bit operating systems, but SimFɪT will only run on 64-bit operating systems.

❍ SimFɪT and SimDₑM do not use the registry: all configuration relies on the same set of ASCII text files (*.cfg) and, if any such configuration file is deleted, SimFɪT or SimDₑM will create a default copy.

❍ SimFɪT no longer requires the installation of GhostScript, GSview, or a specified PDF reader but retains all previous options for *.eps and *.pdf files. Windows users who want to make the best use of SimFɪT graphics should save SVG or PNG files directly or, for better quality and greater versatility, archive EPS files. These can be transformed into PNG, PDF or other types of graphics files for importing into documents as required, using the SimFɪT interface to the GhostScript DLLs.

## 3   Installing the Simfit package

There is only one version of SimFɪT : the Academic version which is free-standing and requires no other libraries. However the program `x64_change_simfit_version.exe` can allow SimFɪT to use the NAG library DLLs if you have an operational copy of the NAG library DLLs, from Mark 20 onwards.

Note: only 64-bit versions of SimFɪT are distributed.

The 64-bit SimFɪT driver program is called x64_simfit.exe.

**(a)** The SimFɪT setup programs will install SimFɪT in MS Windows, and also in Linux where Wine is installed, or in Mac with Crossover.

You should uninstall previous versions of SimFɪT using the Windows Program Manager. However, if you decide to over-write an existing SimFɪT with the same version numbers, make sure that the existing SimFɪT files do not have the read-only attribute, otherwise you could end up with inconsistent binaries and test files. Existing *.cfg files and files you make are never over-written by the installation program.

**(b)** Download the setup files from one of the SimFɪT websites:

`https://simfit.uk, https://simfit.org.uk, or simfit.silverfrost.com.`

The setup file for version 8 is `simfit_setup8_x_y.exe` ... the complete 64-bit SimFIT package.
The subscripts `_x_y` are the release numbers.

**(c)** In Windows, install using `simfit_setup8_x_y.exe` after using your virus checker by double–clicking from Windows Disc Explorer and, unless there is some very compelling reason to the contrary, choose to install in the default top-level folder.

The 64-bit installation program will create the default folders:

```
C:\Program Files\simfit\bin...(binaries)
C:\Program Files\simfit\doc...(documentation)
C:\Program Files\simfit\dem...(demonstration data)
```

and also personal folders in the hidden folder `C:\ProgramData` which you can make visible using Windows Explorer.

**(d)** Non-default installations. The installation will create sub-folders under your chosen top-level folder, and in your `\ProgramData\Simfit` folder but this is not recommended as some SimFIT programs may not work.

**(e)** In Linux, copy `x64_simfit.exe` into the Wine C: equivalent, e.g.
`/home/user-name/.wine/drive_c`
In new installations you will now create the two files

```
l_simfit.cfg
w_simfit.cfg
```

If you mistakenly install the Windows configuration it will not run properly in Linux, and you will have to delete these two files and let SimFIT create a default configuration. As root, run using wine, i.e. `wine w_simfit.exe`, or run from the appropriate Wine or KDE start menu. Further details will be found on the SimFIT website and in linux.txt.

**(f)** The SimFIT package is run from the program manager program `x64_simfit.exe`, and you do not need to run any other SimFIT programs.

Make a shortcut from your desktop to the SimFIT program manager
`C:\Program Files\simfit\bin\x64_simfit.exe`).
Run this shortcut and read any warning messages. Finally, press the [Configure] button, then the [Check] button to correct the paths if necessary, and finally the [Apply] button to complete the configuration.

**(g)** If you decide not to use the default folders, that is allowed as long as the installation folder ends like this `...\Simfit`. You can install any binaries you like as auxiliaries, as long as the fully qualified path is provided using the [Configure] option.

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**(h)** Run `x64_simfit.exe` at least once from the installation folder with all flags switched on to check for missing or obsolete files.

When a good configuration has been set up, you should switch off the options to check for missing files, etc. to speed up the start up and prevent errors arising from impatient double clicking.

**(i)** Where SIMF_IT is for group use, the test files `*.tf?` could be made read-only, or refreshed regularly, to prevent accidental editing leading to corrupt test files.

**(j)** Print or browse the SIMF_IT manual `w_manual.pdf` using your default PDF-viewer. This can be done from the [Manual] button on the `x64_simfit.exe` main page if SIMF_IT is configured properly.

**(k)** Common errors include inconsistent .exe or .dll files, failing to configure SIMF_IT correctly so it cannot use an auxiliary program, or not allowing SIMF_IT write permission to create configuration and results files.

# 4 Using Simfit with the NAG library DLLs

SIMF_IT was originally developed as a front end to use the NAG library on mainframes. Subsequently an alternative free Open Source library was developed to replace the NAG library on the PC using DOS, then Salford Software DBOS, and then Windows.

With the release of the NAG library DLLs for Windows, two programs have been developed so that SIMF_IT users can switch at will between using the SIMF_IT library or the NAG library for numerical calculations.

If a user has a valid licensed version of the NAG library DLLs available there are some advantages in making the swap. In particular, some of the MKL NAG routines, e.g. those using LaPack and BLAS, will execute faster than the SIMF_IT academic ones, and there are a number of additional options available, particularly when using the NAG differential equation solving and optimization routines.

To switch between the academic and NAG libraries the following technique must be used.

1. Make sure that SIMF_IT is switched off so that no DLLs are linked in.

2. Use Windows explorer to move into the SIMF_IT binary folder which will be something like
`C:\Program Files\Simfit\bin` for the 64-bit version.

3. As administrator execute the program
`x64_change_simfit_version.exe` for the 64-bit version.

4. If you try to swap to the NAG version you may encounter one of two problems.

- The utility may not be able to find the alternative interface DLLs.
- The NAG version created may not run because it cannot locate the NAG DLLs on the path.
- The NAG version created may report that there is no valid license.

If this happens then correct the mistake or restore the academic version.

# 5   Installing the Simdem package

This is a subset of the SimFit package designed to allow Fortran programmers to use subroutines from either
`w_menus.dll` and `w_graphics.dll`, or
`x64_menus.dll` and `x64_graphics.dll`
to create stand-alone executables that will run in MS Windows, Linux under Wine, or Mac under crossover.

It comes with a help program called `simdem.chm`, source codes for the driver, 70 example programs, and compiled versions of `simdem.exe` and `x64_simdem.exe`.

The 32-bit SimDem driver program is called simdem.exe.
The 64-bit SimDem driver program is called x64_simdem.exe.

There is only one installation file which installs both the 32-bit and 64-bit binaries, but there are several alternative forms as follows.

**(A)** Silverfrost FTN95 in 32-bit CDECL mode, and also in 64-bit mode. These are the versions bundled with the FTN95 compiler and can link to either 32-bit CDECL DLLs, or 64-bit DLLs.

**(B)** The gFortran 64-bit version. This is for linking to executables made using 64-bit gFortran.

**(C)** The NAGfor 32-bit version using the -compatible switch (which invokes STDCALL mode) and the NAGfor 64-bit version. Both of these use the Silverfrost Clearwin+ interface to the Windows API. These are the versions bundled with the NAG builder.

The default configuration is

```
C:\Program Files\Simdem\bin   ...(binaries)
C:\Program Files\Simdem\f95   ...(free format codes)
C:\Program Files\Simdem\for   ...(fixed format codes)
C:\Program Files\Simdem\doc   ...(txt,html,pdf files)
C:\Program Files\Simdem\dem   ...(demonstration data)
```

The SimDem run time system depends on the compiler version as follows.

- Silverfrost FTN95

  The 32-bit dll is `simdem32.dll` (CDECL) and the 64-bit version is `simdem64.dll`.

- NAGfor

  The 32-bit dlls are `w_clearwin.dll`, `w_graphics.dll`, and `w_clearwin.dll` (STD-CALL) and the 64-bit ones are `x64_clearwin`, `x64_graphics.dll`, and `x64_clearwin.dll`.

- gFortran

  The 64-bit dlls are `x64_clearwin.dll`, `x64_graphics.dll`, and `w_menus.dll`.

# 6  EPS and SVG graphics

The best and most versatile vector graphics format for archiving and printing professional high quality scientific graphs is PostScript and SIMF<sub>I</sub>T creates such *.eps encapsulated PostScript files. However it only displays a low resolution bit-map representation of the graph on screen using Windows graphics, so SIMF<sub>I</sub>T provides the option to generate a *.pdf file to pass on to your default PDF reader. Also SIMF<sub>I</sub>T can create scalable vector *.svg files for internet use.

Note that PDF, JPG, and PNG files created indirectly this way from SIMF<sub>I</sub>T EPS files will be of higher quality than the same types of files created by Windows.

The GhostScript DLL will be in the `...\simfit\bin` folder.

The 64-bit Ghostscript DLL is called gsdll64.dll