

Installation of Elmer

Obtaining the source, compiling, installing and setting up the system

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The Source of Elmer

- Elmer is available either as **binary**:
Win32 ([SourceForge](#) or [Funet[†]](#)), Ubuntu/Linux ([Funet](#))

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- or as **source** (~ 300k lines of code) from either Funet, SourceForge as [download](#) or using subversion

```
svn co https://elmerfem.svn.sourceforge.net/svnroot/elmerfem  
elmerfem
```

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 - compiling needs patience and endurance
 - + easy update, code is best documentation, customisation

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Binary on Ubuntu/Linux

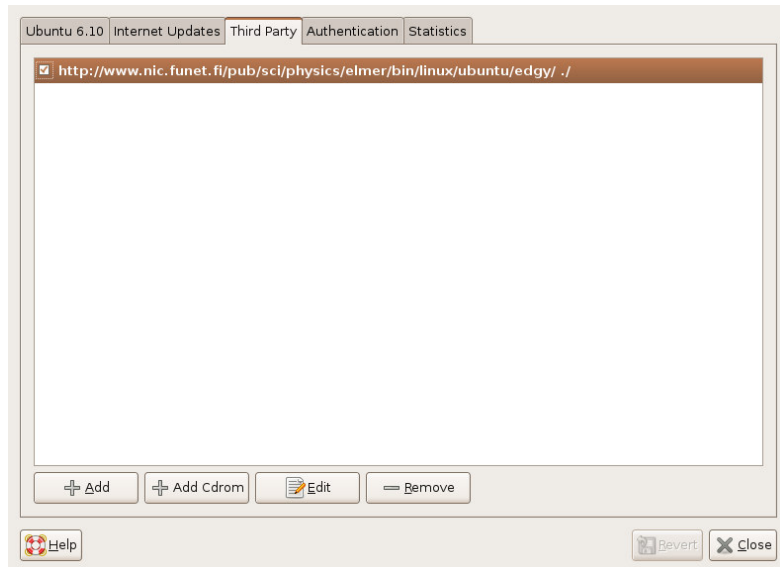
In **Synaptic Package Manager**:

- open menu **Settings**→**Repositories**

Binary on Ubuntu/Linux

In **Synaptic Package Manager**:

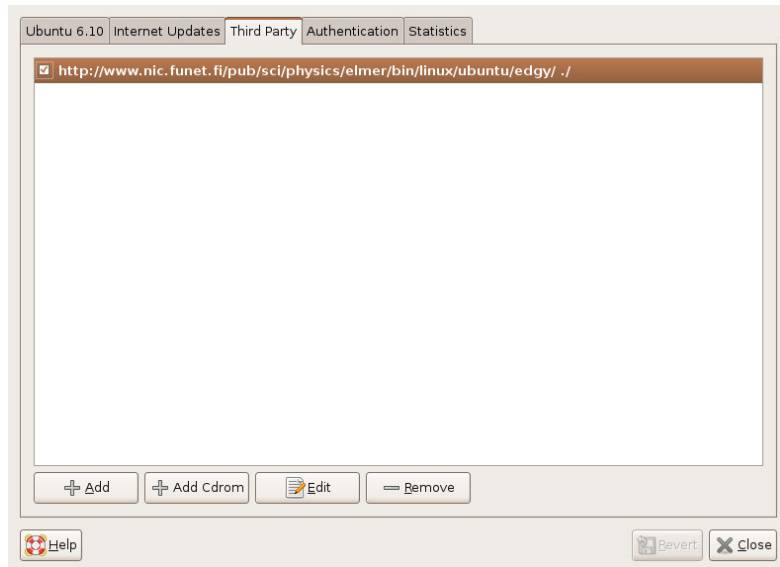
- open menu **Settings**→**Repositories**
- choose **+Add** and add the Funet-server



Binary on Ubuntu/Linux

In **Synaptic Package Manager**:

- open menu **Settings**→**Repositories**
- choose **+Add** and add the Funet-server



- then **Search** for keyword *elmer* and toggle to add

Binary on Win32

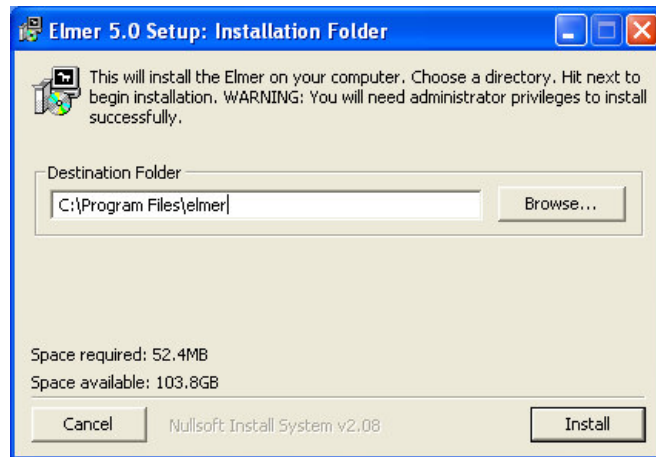
http://www.csc.fi/english/pages/elmer/download/quickstart/index_html

- download the installer from [SourceForge](#)

Binary on Win32

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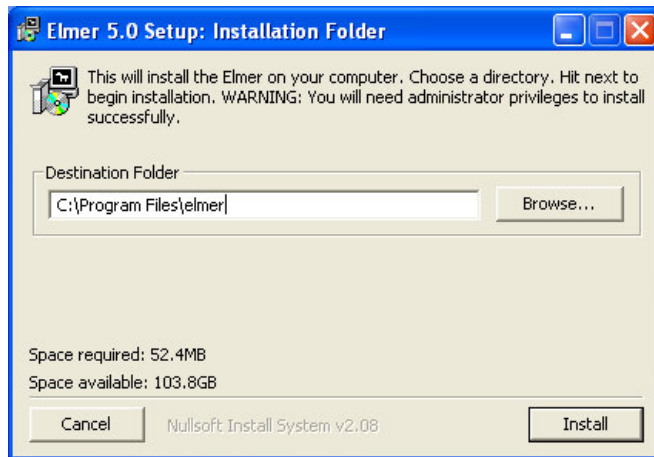
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- double-click the installer - define directory:



Binary on Win32

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- executables are then called from **Start**→**All Programs**→**Accessories**→**Command prompt**

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Mesh2D	Delaunay (2D) mesh generator called by ElmerFront
ViewFactors	computation of view factors

Funet FTP

<http://www.nic.funet.fi/pub/sci/physics/elmer/>

<ftp://ftp.nic.funet.fi/pub/sci/physics/elmer/>

Index of /pub/sci/physics/elmer

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 bin/	15-May-2007 10:15	-	
 doc/	09-Jan-2008 16:43	-	
 src/	28-Sep-2007 14:30	-	
 README	13-Feb-2007 12:31	865	

SourceForge SVN

<http://sourceforge.net/projects/elmerfem/>

The screenshot shows the SourceForge website interface. At the top, the 'SOURCEFORGE.NET' logo is on the left, and links for 'Log in', 'Create account', and 'Help' are on the right. A navigation bar contains 'Home', 'Browse Software' (highlighted), 'Marketplace' (with a 'NEW' badge), 'Community', 'Create Project', and 'Jobs'. Below this is a search bar with a dropdown set to 'Software', a search button, and a link to 'Advanced' search.

Three sponsored ads are displayed: 'CFdesign - Upfront CFD' (fluid flow simulations), 'Finite Element Analysis' (Design & Fitness-For-Service), and 'Gantt Chart Components' (ActiveX, .NET and Java Controls).

The main content area is titled 'SF.net » Projects » Elmer-fem » Summary'. It features a 'Project' tab (selected) and other tabs: 'Tracker', 'Code', 'Services', 'Download', and 'Wiki'. To the right of the tabs are links for 'Project Web Site', 'Stats', and 'RSS'.

The project description states: 'Elmer is a collection of finite element programs, libraries, and visualization tools for the numerical solution of partial differential equations and multiphysical problems. The main page of Elmer is located at <http://www.csc.fi/elmer>.' Below this is an HP logo and a banner for 'Enter Here to Research Featured Solutions'.

Below the banner are three more sponsored ads: 'MSc Computational Maths' (Challenging course in modern numerical analysis), 'Free 3D Software Download' (3D animation & modeling software), and 'Fluid Dynamics Software' (New, easy, low-cost CFD software).

On the left side, there is a 'Download Elmer-fem' button. Below it, project details are listed: 'Project Admins: apursula, juhar, juhavierinen, mlsf, mmalinen, raback, tzwinger', 'Operating System: (None Listed)', 'License: GNU General Public License (GPL)', and 'Category: Mathematics, Physics, Visualization'.

Below the details is a 'Latest News' section. To the right of the details is a 'Get the most from Open Source' banner with the text 'Buy expert services from Sourceforge.net Marketplace. Support from the people who know.' and the 'SOURCEFORGE.NET Marketplace' logo.

Which packages?

fem	source for the essential parts of ElmerSolver (F90)
elmerpost	source for ElmerPost
elmergrid	source for ElmerGrid
front	source for ElmerFront
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eio	source for Elmer input/output library written in C++
mathlibs	contains basic mathematical libraries such as Lapack, Blas, Arpack, and Parpack
hutiter	source for iterative linear algebra solvers called by ElmerSolver (mostly F90)
matc	source for command file interpreter of ElmerSolver and inside the command window of ElmerPost (C)
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doc	the $\text{\LaTeX}$ -based documentation input files
elmer-doc	help documents of Elmer

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- Optional:
 1. for parallel version MPI library (like OpenMPI) and HyPre
 2. **ffmpeg** and libjpeg to use the MPEG/JPEG plug-in in ElmerPost



UNIX/Linux

```
#!/bin/sh -f
#the compiler (here the gcc 4.X suite)
export CC=gcc
export CXX=g++
export FC=gfortran
export F77=gfortran
#the compiler flags
export CFLAGS=""
export CXXFLAGS=""
export FCFLAGS=""
export F77FLAGS=""
export FFLAGS=""
#linking
export LDFLAGS=""
#paths
export ELMER_HOME="/path/to/Elmerdir"
```

UNIX/Linux contd.

```
# make the modules
modules="matc umfpack mathlibs elmergrid meshgen2d eio hutiter
fem post"
# configure and build
for m in $modules; do
cd $m ; ./configure --prefix=$ELMER_HOME && make clean && make
&& make install && cd ..
done
```

UNIX/Linux contd.

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# make the modules
modules="matc umfpack mathlibs elmergrid meshgen2d eio hutiter
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# configure and build
for m in $modules; do
cd $m ; ./configure --prefix=$ELMER_HOME && make clean && make
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```

● Additional arguments for configure:

- debugging build: `--with-debug`
- 32-bit platform: `--with-64bits=no`

UNIX/Linux contd.

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# make the modules
modules="matc umfpack mathlibs elmergrid meshgen2d eio hutiter
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# configure and build
for m in $modules; do
cd $m ; ./configure --prefix=$ELMER_HOME && make clean && make
&& make install && cd ..
done
```

- Additional arguments for configure:
 - debugging build: `--with-debug`
 - 32-bit platform: `-with-64bits=no`
- adapt the paths in the script above to match your system!
- save it into `compile.sh` in the root of the source-tree
- run the compilation `./compile.sh`

UNIX/Linux parallel MPI

- compile and install a MPI library; e.g. **OpenMPI**

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- Optionally, **Hypre** can be compiled and installed

```
#!/bin/sh -f
#the OpenMPI wrapper
export CC=mpicc
export CXX=mpic++
export FC=mpif90
export F77=mpif90
#the compiler flags
export CFLAGS="-I/usr/local/hypre2.0/include"
export FCFLAGS="-I/usr/local/hypre2.0/include"
export F77FLAGS="-I/usr/local/hypre2.0/include"
export FFLAGS="-I/usr/local/hypre2.0/include"
#linking needs Hypre included
export LDFLAGS="L/usr/local/hypre2.0/lib -lHYPRE"
```

UNIX/Linux parallel MPI contd.

```
#paths; linking needs Hyper and MPI
export ELMER_HOME="/path/to/Elmerdir"
export LD_LIBRARY_PATH="/usr/local/OpenMPI/lib:$LD_LIBRARY_PATH"
export LD_LIBRARY_PATH="/usr/local/hypre2.0/lib:$LD_LIBRARY_PATH"
# make the modules
modules="matc umfpack mathlibs elmergrid meshgen2d eio hutiter
fem post"
# configure and build
for m in $modules; do
cd $m ; ./configure --prefix=$ELMER_HOME
--with-mpi-dir=$MPI_HOME && make clean && make && make install
&& cd ..
done
```

Win32 using MinGw and g95[†]

- Get the installer MinGW-5.1.3.exe from [SourceForge](#) and run it
Install the "current" version
Choose all possible packages to download and install
Install in C : \MinGW

[†] Contribution by Mikko Lyly

Win32 using MinGw and g95[†]

- Get the installer MinGW-5.1.3.exe from [SourceForge](#) and run it
Install the "current" version
Choose all possible packages to download and install
Install in C:\MinGW
- Get the installer MSYS-1.0.10.exe and run it
Install in C:\msys\1.0

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Win32 using MinGw and g95[†]

- Get the installer MinGW-5.1.3.exe from [SourceForge](#) and run it
Install the "current" version
Choose all possible packages to download and install
Install in `C:\MinGW`
- Get the installer MSYS-1.0.10.exe and run it
Install in `C:\msys\1.0`
- Get the installer msysDTK-1.0.1.exe and run it

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Choose all possible packages to download and install
Install in `C:\MinGW`
- Get the installer MSYS-1.0.10.exe and run it
Install in `C:\msys\1.0`
- Get the installer msysDTK-1.0.1.exe and run it
- Download the GCC 4 packages of MinGW
the contents of these packages in /mingw:
`gcc-core-4.2.1-sjlj-2.tar.gz`
`gcc-g++-4.2.1-sjlj-2.tar.gz`
`gcc-gfortran-4.2.1-sjlj-2.tar.gz`

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- Download and run the installer [g95-MinGW.exe](#) for g95
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Win32 using MinGw and g95 contd.

- Download and run the installer [g95-MinGW.exe](#) for g95 (mind: g95 $\neq$ gfortran)
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- test your compiler:

```
$ cat > test.c
/* test.c */
#include <stdio.h>
int main() {
    fprintf(stdout, "It works!");
}
<CTRL-D>
$ gcc-sjlj -O -o test.exe test.c
$ ./test.exe
It works!
:
:
```

Win32 using MinGw and g95 contd.

- Download and run the installer [g95-MinGW.exe](#) for g95 (mind: g95 $\neq$ gfortran)
- Let the installer extract its content into the MinGW structure
- test your compiler:

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$ gcc-sjlj -O -o test.exe test.c
$ ./test.exe
It works!
:
:
```

- also test your fortran compiler!

Win32 using MinGw and g95 contd.

```
#!/bin/sh
export ELMER_HOME=/c/Elmer5.4
export CC=gcc
export CXX=g++
export FC=g95
export F77=g95
export LDFLAGS="-L/mingw/lib/gcc/mingw32/3.4.5/ -Xlinker
--stack=10000000000 "
modules="matc umfpack mathlibs elmergrid meshgen2d eio hutiter
fem"
for m in $modules; do
cd $m
./configure --prefix=$ELMER_HOME
make
make install
cd ..
done
```

Elmer Web

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Suomeksi

CSC's homepage

 Elmer



Elmer

Binaries

Documentation

Sources and compilation

Application examples

Interfaces

White papers

Mailing lists

Links

News

Services and contact

Elmer

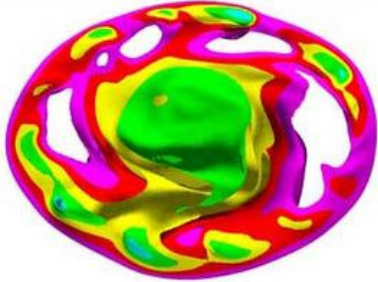
Tämä sivu suomeksi

Open Source Finite Element Software
for Multiphysical Problems

Elmer is an open source multiphysical simulation software developed by [CSC](#). Elmer development was started 1995 in collaboration with Finnish Universities, research institutes and industry.

Elmer includes physical models of fluid dynamics, structural mechanics, electromagnetics, heat transfer and acoustics, for example. These are described by partial differential equations which Elmer solves by the Finite Element Method (FEM).

These pages are intended to give information on the Elmer software and to improve the information transfer in the Elmer community.



Temperature distribution of melt flow in Czochralski growth of silicon.

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Last modified 5.2.2008

Done