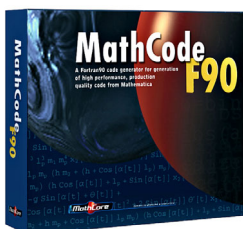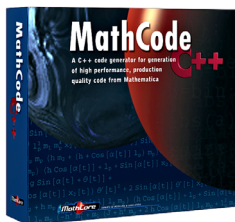# The Mathematica to C++ or Fortran90 Code Translator

■ *"MathCode is a useful addition to Mathematica. In particular for those who want to deploy Mathematica developed algorithms as stand-alone pieces or embedded in some real-time system this functionality is essential."*

Roger Germundsson
Director of Research and Development Wolfram Research, Inc

Are you developing mathematical applications in Mathematica and need dramatically increased performance?

Do you need to distribute standalone executable C++ or Fortran code?

Do you need calls between Mathematica and external C, C++, or Fortran code?

In these cases, a lot of time can be saved by using the MathCode C++ or MathCode F90 translator.

Rapid prototyping

With MathCode code generation software, you can develop prototypes in Mathematica, instead of directly coding it in C++ or Fortran, since MathCode suite will do the C++ and Fortran coding for you. To our knowledge, it's much easier to develop applications in Mathematica than e.g. in C++. MathCode will therefore save you a lot of time and trouble-shooting during your software development. Rapid prototyping in Mathematica will also seamlessly lead to production of quality code.

Makes your application platform independent

Do you often need to distribute your Mathematica applications to users without Mathematica? With MathCode you can develop in Mathematica, and deliver your application to any user, even to those who don't have Mathematica. MathCode generates stand-alone executable code, and no runtime license is necessary for distribution of the compiled code.

Linking Mathematica Code to other applications

With MathCode it's easy to link your mathematical applications developed in Mathematica to other applications. Existing functions/libraries of C, C++, and Fortran77 code can also be linked during compilation. Connectivity to C, C++, or Fortran77 code is obtained by automatic generation of MathLink code for calling generated code and external applications. Callbacks from external applications to Mathematica can also be generated automatically.

Performance improvement of Mathematica applications

A high performance computational application often needs powerful hardware in order to execute the operations fast enough. With MathCode you can take advantage of the speed of native C++ or Fortran code, which can improve the performance of applications developed in Mathematica up to 1000 times and more. Other highlights:

■ Generates readable code, using operator overloading in C++ or using Fortran90 arrays capabilities.

■ Compilation of generated code from within Mathematica.

■ Seamless installation of generated code in Mathematica.

■ Simple switching between internal and generated code.

■ Simple syntax for specifying types in the generated code.

■ Automatic symbolic expansion and subexpression elimination.

■ Customization by user defined Mathematica rules that are interleaved in the code generation process.

■ Simplified syntax for array slicing supported both in Mathematica and in the generated code, to simplify extraction of columns or submatrices.

■ Simple syntax for interfacing external functions including argument type, order, and "call by reference".

■ Support for interpolating functions.

■ Mathematica lists and matrices are represented using the LightMat C++ class library or native Fortran90 arrays, giving:
  • Separate implementation for each matrix and list type for highest performance.
  • Optimized standard operations on lists and matrices.
  • Column major order representation for easy interfacing to numerical packages in Fortran.

Let us tell you more about how MathCode can speed up your application development and improve the performance of algorithms developed in Mathematica. Call us today at +46 13 32 85 00. Download an evaluation version at www.mathcore.com.