

TMB-IDE

current status & road ahead

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ADMB/TMB Developer Workshop

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TMB-IDE

Emacs `tmb-mode` without the Emacs
Version 1.6-2 (2015-10-28)

TMB-IDE

Background

overview, components, history

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Current status

three flavors: mode, ide, virtual

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three flavors: mode, ide, virtual

Road ahead

different from admb-ide, easy to maintain

Overview

Original idea behind TMB-IDE was to provide something similar to ADMB-IDE:

- 1 Quickly **install** TMB on a wide variety of machines, for example, in a workshop setting

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- should TMB-IDE install GCC? where?

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- 2 Efficient and **full-featured environment** to develop TMB models

This is easier.

Components

TMB

R package + stuff

Components

TMB

R package + stuff

GCC

compiler

GDB

debugger

Components

TMB

R package + stuff

GCC

compiler

GDB

debugger

Emacs

editor framework

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TMB Mode

syntax colors

commands

- build
- run
- view
- template
- window layout

Three alternative environments

TMB Mode

Lightweight Emacs mode to develop TMB models

Designed for users who already use Emacs as their main editor

tmb.el (22 KB)

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Config file that lets Emacs behave like a basic editor

The convenient features of TMB Mode for non-Emacs users

.emacs (5 KB)

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Virtual TMB

Fully configured virtual machine

VirtualBox disk that can be installed on any computer

VirtualTMB.vdi (6 GB)

First and current release

	TMB Mode	TMB-IDE	Virtual TMB
2015 Sep	1.0	1.1	1.1
2015 Oct		1.6	1.6
2015 Nov	3.1		

TMB Mode

```
File Edit Options Buffers Tools TMB C++ Help

#include <TMB.hpp>

template<class Type>
Type objective_function<Type>
{
    DATA VECTOR(x);
    PARAMETER(mu);
    PARAMETER(logSigma);

    Type f;
    f = -sum(dnorm(x, mu, exp
return f;
}

View Script C-c C-p
View Compilation C-c C-l
View R Session C-c C-r
Compile C-c C-c
Run C-c C-v
Make C-c RET
Stop C-c C-q
Clean C-c <C-backspace>
Debug C-c C-d
Toggle NaN Debug C-c C-n
Mini Template <f12>
Multi-Window Layout C-c C-w
Help C-c C-f
TMB Mode Version C-c C-.
```

```
 -*- mode: compilation; default-directory: "~/ " -*-
Compilation started at Wed Oct 28 17:32:04

R -quiet --vanilla -e "require(TMB); compile('mini.cpp','-O0 -Wall')"
> require(TMB); compile('mini.cpp','-O0 -Wall')
Loading required package: TMB
g++ -m64 -I/usr/include/R -DNDEBUG -I/home/arnima/r/library/TMB/include -I
/home/arnima/r/library/RcppEigen/include -DTMB_SAFEBOUNDS -DLIB_UNLOAD=R unl
oad_mini -DWITH_LIBTMB -I/usr/local/include -fpic -O0 -Wall -c mini.cpp
-o mini.o
mini.cpp: In member function 'Type objective_function<Type>::operator()()':
mini.cpp:11:29: error: 'Sigma' was not declared in this scope
    f = -sum(dnorm(x, mu, exp(Sigma), true));
                           ^
In file included from /home/arnima/r/library/TMB/include/TMB.hpp:68:0,
                 from mini.cpp:1:
mini.cpp: In instantiation of 'Type objective_function<Type>::operator()()
[with Type = double]':
/home/arnima/r/library/TMB/include/tmb_core.hpp:1416:16: required from hea
re
mini.cpp:8:13: warning: unused variable 'logSigma' [-Wunused-variable]
    PARAMETER(logSigma);
            ^
/home/arnima/r/library/TMB/include/tmb_core.hpp:182:30: note: in definition
of macro 'PARAMETER'
#define PARAMETER(name) Type name(objective_function::fillShape(
                        ^
make: *** [mini.o] Error 1
Error in compile("mini.cpp", "-O0 -Wall") : Compilation failed
Execution halted

Compilation exited abnormally with code 1 at Wed Oct 28 17:32:06

-:-- mini.cpp All L11 (TMB) U:*-* compilation* All L9 (Compilation:exit (1))
```

tmb.el (22 KB)

TMB-IDE

The screenshot shows the TMB-IDE Emacs interface. The left pane displays the source code for `mini.cpp`, which includes a template class `Type` with an `objective_function` member and a `sum` function. The right pane shows the compilation output, indicating a failure due to an undeclared variable `Sigma` in the `sum` function. A menu is open over the source code, listing various actions like 'View Script', 'Compile', 'Run', etc.

```
File Edit Options Buffers Tools TMB C++ Help
#include <TMB.hpp>

template<class Type>
Type objective_function<Type>
{
    DATA VECTOR(x);
    PARAMETER(mu);
    PARAMETER(logSigma);

    Type f;
    f = -sum(dnorm(x, mu, exp(Sigma), true));

    return f;
}

View Script      <f11>
View Compilation
View R Session
Compile          <f8>
Run             <f9>
Make
Stop
Clean           <f7>
Debug           <f10>
Toggle NaN Debug
Mini Template   <f12>
Multi-Window Layout
Help            <f1>
TMB Mode Version

-.*. mode: compilation; default-directory: "~/".
Compilation started at Wed Oct 28 17:35:26

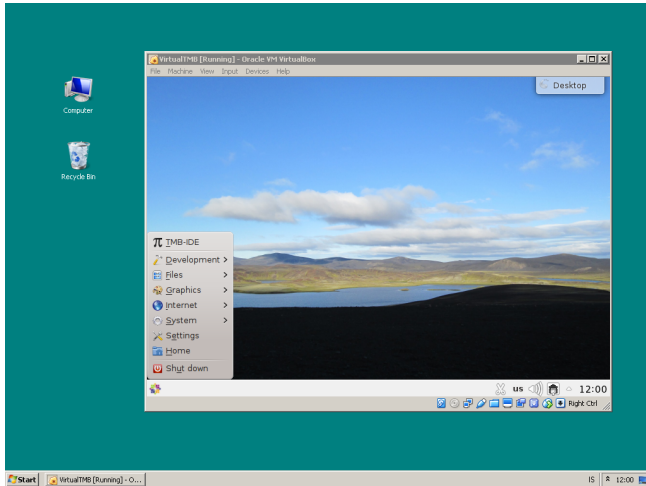
R --quiet --vanilla -e "require(TMB); compile('mini.cpp', '-fno-gnu-unique ->
> require(TMB); compile('mini.cpp', '-fno-gnu-unique -O0 -Wall')
Loading required package: TMB
g++ -m64 -I/usr/include/R -DNDEBUG -I/home/arnima/r/library/TMB/include -I>
mini.cpp: In member function 'Type objective_function<Type>::operator(){}':
mini.cpp:11:29: error: 'Sigma' was not declared in this scope
    f = -sum(dnorm(x, mu, exp(Sigma), true));
                             ^
In file included from /home/arnima/r/library/TMB/include/TMB.hpp:60:0,
from mini.cpp:1:
mini.cpp: In instantiation of 'Type objective_function<Type>::operator(){}':
/home/arnima/r/library/TMB/include/tmb_core.hpp:1416:16: required from he
mini.cpp:8:13: warning: unused variable 'logSigma' [-Wunused-variable]
    PARAMETER(logSigma);
    ^
/home/arnima/r/library/TMB/include/tmb_core.hpp:182:30: note: in definition
#define PARAMETER(name) Type name(objective_function::
    ^
make: *** [mini.o] Error 1
Error in compile("mini.cpp", "-fno-gnu-unique -O0 -Wall") :
  Compilation failed
Execution halted

Compilation exited abnormally with code 1 at Wed Oct 28 17:35:28

-:-- mini.cpp All (11,28) (TMB) U:~*.*. *compilation* All (9,0) (Compilation:exit [1])
```

`.emacs` (5 KB)

Virtual TMB



VirtualTMB.vdi (6 GB)

Download

TMB Mode

<https://github.com/kaskr/adcomp/tree/master/emacs>

also linked from

<http://www.hafro.is/~arnima/tmb.html>

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Virtual TMB

Analogous to ADMB-IDE, but a virtual machine (6 GB) instead of an installer (0.2 GB)

Quick to start a workshop, practical introduction to Linux, but requires maintenance and learning from the user

Easy to maintain

Not a big bundle, just three files to maintain:

① `tmb.el`

Relatively frequent updates

② `.emacs`

Occasional updates, paired with a particular version of `tmb.el`

③ `VirtualTMB.vdi`

Rarely updated – mainly useful for experimenting, improving performance on a Windows computer, and as a last resort on computers with a restricted user account