

GammaLib - Action #261

Feature # 226 (Closed): Parallelize maximum likelihood computation

Study possible options for parallelization

07/02/2012 12:05 PM - Knödseder Jürgen

Status:	Closed	Start date:	06/16/2012
Priority:	Normal	Due date:	
Assigned To:		% Done:	100%
Category:		Estimated time:	35.00 hours
Target version:	Stage Jean-Baptiste Cayrou		
Description			
As a first step of the project we should study the possible options that exists for code parallelization.			
We recall the requirements:			
<ul style="list-style-type: none">• no code dependencies (use only native C++ features)• no limits due to Python Global Interpreter Lock (GIL)• support concurrent memory access• enabling / disabling during compile time• selection of number of cores during setting of environment variable			

History

#1 - 07/02/2012 12:07 PM - Knödseder Jürgen

- Description updated

- Estimated time set to 35.00

- Remaining (hours) set to 35.0

#2 - 07/02/2012 12:28 PM - Anonymous

- Status changed from New to In Progress

#3 - 07/02/2012 12:53 PM - Anonymous

Some information about Swig and threads:

<http://stackoverflow.com/questions/2510696/allowing-threads-from-python-after-calling-a-blocking-i-o-code-in-a-python-extern>

<http://matt.eiffelle.com/2007/11/23/enabling-thread-support-in-swig-and-python/>

<http://code.activestate.com/recipes/52294-use-modules-generated-with-swig-in-a-multi-thread-/>

#4 - 07/05/2012 04:32 PM - Anonymous

- Status changed from In Progress to Resolved

#5 - 07/05/2012 04:59 PM - Anonymous

- % Done changed from 0 to 100

Finally, I will use the **OpenMP API** which allow multi-threading just with directive for compiler.
For instance the following directive will share the loop on several threads.

```
#pragma omp for
```

```
for(int i=0;i<n;i++)  
{  
...  
}
```

It is easy to parallelize a code. When the option is disabled the compiler does not care the pragma lines and it works like for a mono thread code.

Many compilers implement the OpenMP API (with gcc, just add "-fopenmp" to activate it).
Moreover it is possible to set the number of thread with an environment variable (OMP_NUM_THREADS)

#6 - 07/10/2012 03:54 PM - Anonymous

- Status changed from Resolved to Closed
- Remaining (hours) changed from 35.0 to 0.0

#7 - 07/28/2012 12:53 AM - Knödseder Jürgen

- Target version deleted (Stage Jean-Baptiste Cayrou)

#8 - 07/28/2012 12:53 AM - Knödseder Jürgen

- Target version set to Stage Jean-Baptiste Cayrou