

Matlab on multi-processor machines

The aim of this short guide is to get you started with using matlab in a multi-processor environment. The goal is to instruct matlab to use a `pool' of n processors rather than a single one to speed up calculations.



Before trying to parallelize any codes, please make sure your code works as expected on one processor.



matlab versions prior to 2007 do not have the features discussed here.

Parallel Computing Toolbox aka matlabpool

matlabpool can be used to parallelize your m script across multiple cores in a single machine.

Open matlab and initialize the parallel environment

```
matlab -nodesktop

>> matlabpool ( 'open', 'local', 8)
Starting matlabpool using the 'local' configuration ... connected to 8 labs.
>> p=findResource('scheduler', 'configuration', 'local');

p =

Local Scheduler Information
=====

                                Type : local
                        ClusterOsType : unix
                        ClusterSize : 8
                        DataLocation :
/home/lenocil/.matlab/local_scheduler_data/R2010b
                        HasSharedFilesystem : true

- Assigned Jobs

                        Number Pending : 0
                        Number Queued : 0
                        Number Running : 1
                        Number Finished : 0

- Local Specific Properties

                        ClusterMatlabRoot : /software/matlab/matlab-R2010b
```

The `matlabpool` cmd instructs matlab that you intend to run your program in on multiple processors. In the example above you are using a parallel environment called ``local'` (this is usually the default. See below on how to change its properties or create a custom one.) requesting 8 processors. ``local'` allocates resources that can be listed using the cmd `findResource`.

At this point you can start programming in matlab as usual. To make sure you can fully utilize the resources that `matlabpool` allocates, do not forget to write your loops using `parfor`. Once finished remember to close `matlabpool`

```
matlabpool('open',4); % opens the default parallel environment, usually
called `local'
parfor k = 1 : 100000
    some code
end
matlabpool close % release the resources
```

Managing parallel configurations

Open matlab with gui and click on the ``Parallel'` tab

Configurations Manager

File Edit

Default	Name ▲	Type	Description	Valid
☐	local	local		---
☒	test	generic		---

Configuration Validation

Name:	Test Stage	Status	Max Time Per Stage
Type:	Find Resource	Details...	240 Seconds ☒ Use Default
Status:	Distributed Job	Details...	
	Parallel Job	Details...	
	Matlabpool	Details...	

Help Start Validation

Gotchas

- `parfor` executes loop in an order that suits matlab, that is not sequentially
- `parfor` loops cannot be nested

Useful readings

http://vtchl.uiuc.edu/sites/default/files/MATLAB_Report.pdf

From:
<https://helpdesk.physics.leidenuniv.nl/wiki/> - **Computer Documentation Wiki**

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