

Installing GPOPS:

Notes:

There are two out of date dependencies in the IPOPT third party file.

You will have to download the Third party METIS and replace it with the old metis file. (you will have to change the name to Metis for the computer to recognize it.

For MUMPS you will go into the get.Mumps file and on line 31 change the url to access the link below.

<https://github.com/coin-or-tools/ThirdParty-Metis/tree/stable/2.0> (version 4.3)

[http://coin-or-tools.github.io/ThirdParty-Mumps/MUMPS\\_4.10.0.tar.gz](http://coin-or-tools.github.io/ThirdParty-Mumps/MUMPS_4.10.0.tar.gz) (version 4.10)

./configure CFLAGS=-Wno-error-implicit-function-declaration FCFLAGS=-fallow-argument-mismatch  
FFLAGS=-fallow-argument-mismatch (when pasting in terminal there is a space and not a new tab)

<https://stackoverflow.com/questions/69912107/why-does-find-packagempi-generate-a-warning-message>

Notes: I have tried going through the different make files and changing the .cmake files to the find\_package methods

In finder in the directory /opt/homebrew/cellar/cmake/3.26.4/share/cmake/modules

When searching for the pkg\_config file you can access it when pressing "Modules" but it comes up when HWLOC as the file in "This mac"

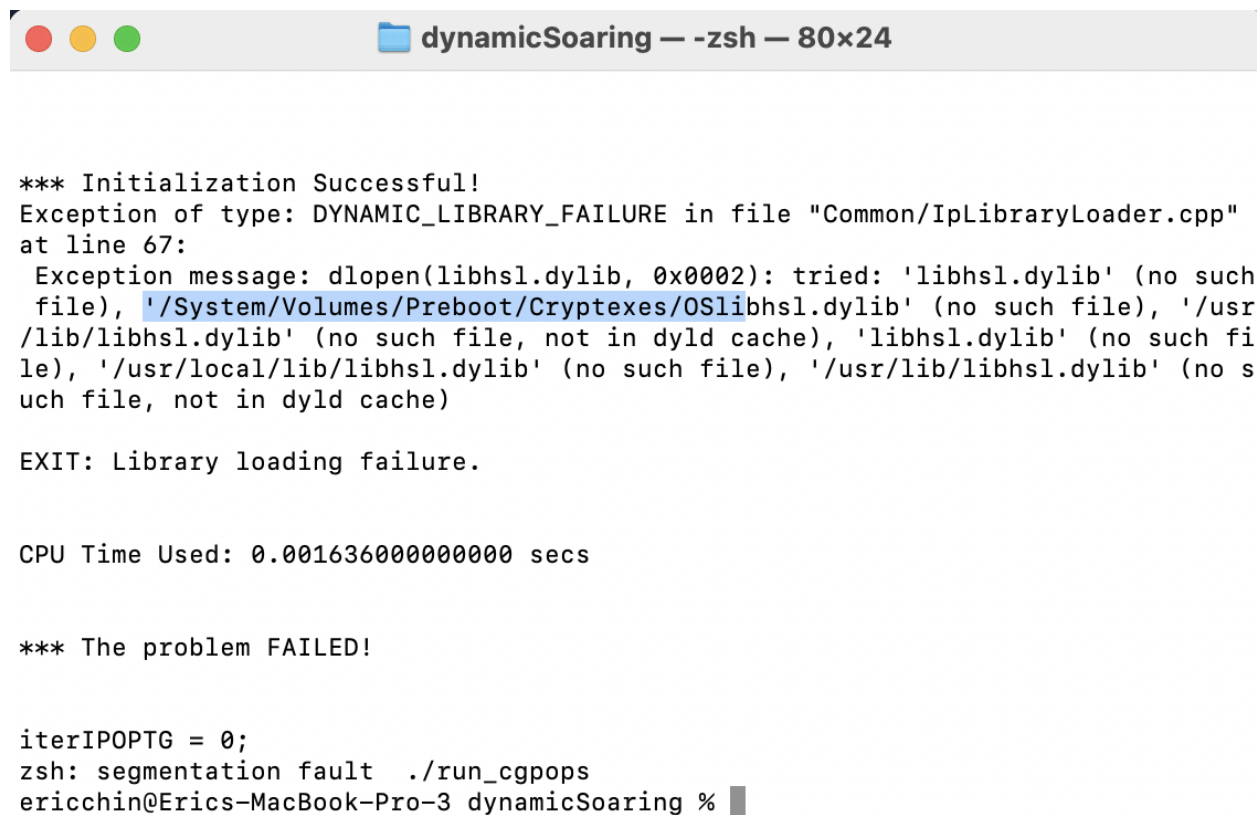
"With such inclusion the call to find\_package\_handle\_standard\_args performed inside FindPkgConfig.cmake is interpreted as from the FindHWLOC.cmake module, because the latest find\_package call has MPI argument instead of PkgConfig (Look at line 98)

Brew install suite-sparse

Brew install superlu

<https://gitlab.com/libeigen/eigen/-/issues/2288>

[https://gitlab.com/libeigen/eigen/-/merge\\_requests/563](https://gitlab.com/libeigen/eigen/-/merge_requests/563)



```
*** Initialization Successful!
Exception of type: DYNAMIC_LIBRARY_FAILURE in file "Common/IpLibraryLoader.cpp"
at line 67:
  Exception message: dlopen(libhsl.dylib, 0x0002): tried: 'libhsl.dylib' (no such
  file), '/System/Volumes/Preboot/Cryptexes/OSlibhsl.dylib' (no such file), '/usr
  /lib/libhsl.dylib' (no such file, not in dyld cache), 'libhsl.dylib' (no such fi
  le), '/usr/local/lib/libhsl.dylib' (no such file), '/usr/lib/libhsl.dylib' (no s
  uch file, not in dyld cache)

EXIT: Library loading failure.

CPU Time Used: 0.0016360000000000 secs

*** The problem FAILED!

iterIPOPTG = 0;
zsh: segmentation fault ./run_cgpop
ericchin@Eric's-MacBook-Pro-3 dynamicSoaring %
```

Notes:

PG is the number of phases in a problem.

nsG is the number of static parameters that are in a problem.

nbG is the number of event constraints in a problem.

nepG is the number of endpoint parameters in a problem.

Cgpops\_main.cpp are where the problem specifications and bounds are provided. As well as making the mesh used for the Legendre-Gauss-Radau transcription.

Cgpops\_wrapper.cpp is where the settings of the mesh refinement process are specified. It is the settings and configurations for the mesh.

cgpopsAuxDec.cpp is used to make the initial and external declarations, respectively, of user-defined global variables.

Cgpops.gov.hpp is used to define the equations of the continuous file

In main

```
antuser@antlaptop: ~/Documents/HII_Code...  antuser@antlaptop: ~/Documents/HII_Code...  antuser@antlaptop: ~/Documents/HII_Code...  antuser@antlaptop: ~/Documents/HII_Code...  antuser@antlaptop: ~/Documents/HII_Code...  
antuser@antlaptop: ~/Documents/HII_Code_stuff/HII_GPops/GPops_C++/examples/turtleBot$ lscpu  
Command 'lscpu' not found, did you mean:  
  command 'lscpu' from deb util-linux (2.37.2-4ubuntu3)  
Try: sudo apt install <deb name>  
antuser@antlaptop: ~/Documents/HII_Code_stuff/HII_GPops/GPops_C++/examples/turtleBot$ lscpu  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Address sizes: 39 bits physical, 48 bits virtual  
Byte Order: Little Endian  
CPU(s): 8  
On-line CPU(s) list: 0-7  
Vendor ID: GenuineIntel  
Model name: Intel(R) Xeon(R) CPU E3-1505M v5 @ 2.80GHz  
CPU family: 6  
Model: 94  
Thread(s) per core: 2  
Core(s) per socket: 4  
Socket(s): 1  
Stepping: 3  
CPU max MHz: 3700.0000  
CPU min MHz: 800.0000  
BogoMIPS: 5599.85  
Flags: fpu vme de pse tsc nr pae mce cx8 apic sep ntr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpeibg rdtscln constant_tsc art arch_perfmon pebs b  
s rep_good nopl xtopology nonstop_tsc cpuid aperfperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadli  
ne_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single pti ssbd ibrs lbrs l1bpb stibp tpr_shadow vmm flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmt1  
avx2 snep bmt2 erms invpcid mpx rdseed adx snap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp nd_clear flush_lid arch_  
capabilities  
Virtualization features:  
Virtualization: VT-x  
Caches (sum of all):  
L1d: 128 KIB (4 instances)  
L1i: 128 KIB (4 instances)  
L2: 1 MiB (4 instances)  
L3: 8 MiB (1 instance)  
NUMA:  
NUMA node(s): 1  
NUMA node0 CPU(s): 0-7  
Vulnerabilities:  
  Itlb multihit: Mitigation: VMX disabled  
  L1tf: Mitigation: PTE Inversion; VMX conditional cache flushes, SMT vulnerable  
  Mds: Mitigation: Clear CPU buffers; SMT vulnerable  
  Meltdown: Mitigation: PTI  
  Mmio stale data: Mitigation: Clear CPU buffers; SMT vulnerable  
  Retbleed: Mitigation: IBRS  
  Spec store bypass: Mitigation: Speculative Store Bypass disabled via prctl  
  Spectre v1: Mitigation: usercopy/swapgs barriers and __user pointer sanitization  
  Spectre v2: Mitigation: IBRS, IDPB conditional, STIBP conditional, RSB filling, PBSRB-eIBRS Not affected  
  Srbds: Mitigation: Microcode  
  Tsx async abort: Mitigation: TSX disabled
```

```

0[ ] 1.3% 4[ ] 3.2%
1[ ] 0.0% 5[ ] 1.3%
1[ ] 4.2% 6[ ] 9.2%
1[ ] 0.0% 7[ ] 2.6%
Mem[ ] 4.04G/15.5G Tasks: 165, 1047 thr; 1 running
Swap[ ] 0K/2.00G Load average: 0.44 0.38 0.45
                               uptime: 00:41:33

```

PID	USER	PPID	NI	VIRT	RES	SHR	S	CPUN	MEM%	TIME	Command
686	avahi	20	0	1008K	664K	376K	S	2.2	0.0	1:49.46	avahi-daemon: running [antlaptop-2.local]
1819	antuser	20	0	4890K	374K	229K	S	3.9	2.4	3:04.59	/usr/bin/gnome-shell
7976	antuser	20	0	2210K	716K	368K	R	2.6	0.0	0:05.26	htop -run cpopos
3918	antuser	20	0	2665K	107K	100K	S	1.3	1.1	0:11.85	/snap/firefox/2800/usr/lib/firefox/firefox -contentproc -chldID 4 -lsForBrowser -prefsLen 29713 -prefMapSize 237178 -jsInitLen 236400 -parentBul
1868	antuser	20	0	4890K	374K	229K	S	0.7	2.4	0:05.67	/usr/bin/gnome-shell
1910	antuser	20	0	4890K	374K	229K	S	0.7	2.4	0:00.04	/usr/bin/gnome-shell
2931	antuser	20	0	33.0G	64480	5840K	S	0.7	0.4	0:00.40	/usr/share/code/code --type=utility --utility-sub-type=network.mojon.NetworkService --lang=en-US --service=sandbox-type=none --crashpad-handler=pi
3832	antuser	20	0	789K	6752	4932	S	0.7	0.4	0:19.41	/usr/libexec/gnome-terminal-server
5326	antuser	20	0	2800K	375K	94820	S	0.7	2.4	0:18.92	/snap/firefox/2800/usr/lib/firefox/firefox -contentproc -chldID 13 -lsForBrowser -prefsLen 30000 -prefMapSize 237178 -jsInitLen 236400 -parentBul
7266	antuser	20	0	1121K	170K	67392	S	0.7	1.1	0:10.94	/usr/share/code/code --type=utility --utility-sub-type=node.mojon.NodeService --lang=en-US --service=sandbox-type=none --inspect-port=0 --crashpad
7436	antuser	20	0	5127K	191K	133K	S	0.7	1.2	0:00.07	/home/antuser/.vscode/extensions/ms-vscode.cpptools-1.16.3-linux-x64/bin/cpptools-srv 7329 (0A02C88E-81C3-4419-B0F6-B1FF46A9967B)
1	root	20	0	307K	12232	3392	S	0.0	0.1	0:01.85	/sbin/init splash
305	root	19	1	57212	27896	26268	S	0.0	0.2	0:00.57	/lib/systemd/systemd-journald
338	root	20	0	26972	7284	4688	S	0.0	0.0	0:00.35	/lib/systemd/systemd-udev
515	systemd-o	20	0	14824	6256	460	S	0.0	0.0	0:04.58	/lib/systemd/systemd-oond
519	systemd-r	20	0	25660	13940	4608	S	0.0	0.1	0:00.35	/lib/systemd/systemd-resolved
520	systemd-t	20	0	89376	6660	8800	S	0.0	0.0	0:00.14	/lib/systemd/systemd-timesyncd
577	systemd-t	20	0	89376	6660	8800	S	0.0	0.0	0:00.00	/lib/systemd/systemd-timesyncd
592	root	20	0	242K	7768	888	S	0.0	0.0	0:00.18	/usr/libexec/accounts-daemon
594	root	20	0	2812	1136	1048	S	0.0	0.0	0:00.17	/usr/sbin/acpid
607	root	20	0	18148	2984	2728	S	0.0	0.0	0:00.00	/usr/sbin/cron -f -P
610	messagebu	20	0	11096	6620	4076	S	0.0	0.0	0:01.58	dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-only
612	root	20	0	263K	19460	15996	S	0.0	0.1	0:01.44	/usr/sbin/NetworkManager --no-daemon
620	root	20	0	82800	3872	1512	S	0.0	0.0	0:00.39	/usr/sbin/irqbalance --foreground
624	root	20	0	49744	20964	11600	S	0.0	0.1	0:00.11	/usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
625	root	20	0	231K	10348	820	S	0.0	0.1	0:02.26	/usr/libexec/polkitd --no-debug
628	root	20	0	242K	572	4840	S	0.0	0.0	0:00.05	/usr/libexec/power-profiles-daemon
629	syslog	20	0	217K	5856	4504	S	0.0	0.0	0:00.10	/usr/sbin/rsyslogd -n -NONE
630	root	20	0	1432K	39260	20340	S	0.0	0.2	0:02.63	/usr/lib/snapd/snapd
631	root	20	0	239K	6892	1280	S	0.0	0.0	0:00.05	/usr/libexec/switcheroo-control
634	root	20	0	48256	8252	5992	S	0.0	0.1	0:00.26	/lib/systemd/systemd-logind
636	root	20	0	134K	9452	8616	S	0.0	0.1	0:00.28	/usr/sbin/thermald --systemd --dbus-enable --adaptive
637	root	20	0	231K	10348	820	S	0.0	0.1	0:00.06	/usr/libexec/polkitd --no-debug
640	root	20	0	383K	13520	10684	S	0.0	0.1	0:00.26	/usr/libexec/udisks2/udisksd
643	root	20	0	17692	11216	9276	S	0.0	0.1	0:00.08	/sbin/wpa_supplicant -u -s -O /run/wpa_supplicant
650	syslog	20	0	217K	5856	4504	S	0.0	0.0	0:00.03	/usr/sbin/rsyslogd -n -NONE
651	syslog	20	0	217K	5856	4504	S	0.0	0.0	0:00.06	/usr/sbin/rsyslogd -n -NONE
652	avahi	20	0	7440	336	0	S	0.0	0.0	0:00.00	avahi-daemon: chroot helper
653	syslog	20	0	217K	5856	4504	S	0.0	0.0	0:00.04	/usr/sbin/rsyslogd -n -NONE
665	root	20	0	383K	13520	10684	S	0.0	0.1	0:00.00	/usr/libexec/udisks2/udisksd
680	root	20	0	231K	10348	820	S	0.0	0.1	0:00.45	/usr/libexec/polkitd --no-debug
681	root	20	0	383K	13520	10684	S	0.0	0.1	0:00.03	/usr/libexec/udisks2/udisksd
686	root	20	0	10592	5440	5004	S	0.0	0.0	0:00.10	/usr/lib/bluetooth/bluetoothd