

GeneRax on HPC

What is GeneRax?

GeneRax is a parallel tool for species tree-aware maximum likelihood based gene family tree inference under gene duplication, transfer, and loss.

It infers gene family trees from their aligned sequences, the mapping between genes and species, and a rooted undated species tree. In addition, it infers the duplication, transfer, and loss events that best (in terms of maximum likelihood) reconcile the gene family trees with the species trees. [\[Source\]](#)

Links:

[GitHub](#)

[Documentation](#)

Versions Available:

The following versions are available on the cluster:

- GeneRax-v1.0.0

How to load GENERAX?

To load GENERAX, use the following commands:

```
#Load the GENERAX module  
module load bio/generax
```

To verify if the module and dependencies are loaded correctly, use the following command.

```
#Show all the modules loaded
module list
```

This should list all the software and dependencies that are loaded. In this case, 3 dependencies should be loaded, including openMPI.

How to use GENERAX?

The main executable for the program is generax.

```
#Generax syntax

GeneRax v1.0.0
-h, --help
-f, --families <FAMILIES_INFORMATION>
-s, --species-tree <SPECIES_TREE>
--strategy <STRATEGY> {EVAL, SPR}
-r --rec-model <reconciliationModel> {UndatedDL, UndatedDTL, Auto}
--rec-opt <reconciliationOpt> {window, simplex}
-p, --prefix <OUTPUT_PREFIX>
--duplicates <DUPLICATES_NUMBER>
--init-strategies <1 or 4>
--unrooted-gene-tree
--per-family-rates
--per-species-rates
--dup-rate <duplication rate>
--loss-rate <loss rate>
--transfer-rate <transfer rate>
--max-spr-radius <max SPR radius>
--rec-weight <reconciliation likelihood weight>
--seed <seed>
Please find more information on the GeneRax github wiki
```

Generax tutorial can be found on its [GitHub](#) website.

To run generax with MPI, jump to a compute node using the following command or a similar sbatch script,

```
# Jump to compute node
srun -p main --qos main -N 2 -c 16 --mem 16G --pty bash

# use generax
mpiexec -np ${SLURM_CPUS_ON_NODE} generax <additional commands here>
```

Where to find help?

If you are stuck on some part or need help at any point, please contact OIT at the following address.

<https://ua-app01.ua.edu/researchComputingPortal/public/oitHelp>