NextDenovo on HPC

What is NextDenovo?

NextDenovo is a string graph-based *de novo* assembler for long reads (CLR, HiFi and ONT). It uses a "correct-then-assemble" strategy similar to canu (no correction step for PacBio HiFi reads), but requires significantly less computing resources and storages. After assembly, the per-base accuracy is about 98-99.8%, to further improve single base accuracy, please use NextPolish.

NextDenovo contains two core modules: NextCorrect and NextGraph. NextCorrect can be used to correct long noisy reads with approximately 15% sequencing errors, and NextGraph can be used to construct a string graph with corrected reads. It also contains a modified version of minimap2 and some useful utilities (see below links for more details).[Source]

Links:

[Official Website](#)

[Manual](#)

Versions Available:

The following versions are available on the cluster:

- nextDenovo v2.4.0

How to load NextDenovo?

To load NextDenovo, use the following commands:

```
#Load the NEXTDENOVO module
module load bio/nextdenovo
```

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 NextDenovo dependencies that are loaded – miniconda environment in this case.

How to use NextDenovo?

To demonstrate the usage of this software, copy all the test files for the following directory to the user's test folder.

```
# copy test files
cp -r  /share/apps/NextDenovo/NextDenovo/test_data .
# Remove preprocessed files
rm -r ./test_data/01_rundir
```

Now load the nextDenovo module, and edit run.cfg under /test_data. This is the configuration file for nextDenovo. Under this, set parallel_jobs 16. This will use 16 parallel task for operation.

Use the following SLURM script to submit the job to the scheduler,

```
#!/bin/bash
#SBATHC -J test_next_denovo
```

```
#SBATCH -p main
#SBATCH --qos main
#SBATCH --ntasks=1
#SBATCH --cpus-per-task=16  # SAME AS IN CONFIG SCRIPT
#SBATCH -e err.out
#SBATCH -o out.out

# Load the module
module load bio/nextdenovo

# Go to the directory if script is in diffrent direcity
# launch next denovo

nextDenovo run.cfg
```

The output should be in the same directory as the script. See the official page for more info on the software.

Where to find help?

If you are confused or need help at any point, please contact OIT at the following address.

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