

## Assignment 2: Related works summary

### • simuG

- SimuG is a lightweight tool for simulating the full-spectrum of genomic variants (single nucleotide polymorphisms, Insertions/Deletions, copy number variants, inversions and translocations) .
- Is a command-line tool written in Perl and supports all mainstream operating systems.
- Takes the user-supplied reference genome (in FASTA format) as the working template to introduce non-overlapping genomic variants of all major types (i.e. SNPs, INDELs, CNVs, inversions and translocations).
- Code in Perl along with user manual and testing data is available at <https://github.com/yjx1217/simuG>.
- This software is free for use under the MIT license.

### • DeepSimulator

- DeepSimulator, is mimic the entire pipeline of Nanopore sequencing. Starting from a given reference genome or assembled contigs, we simulate the electrical current signals by a context-dependent deep learning model, followed by a base-calling procedure to yield simulated reads.
- The thorough experiments performed across four species show that the signals generated by our context-dependent model are more similar to the experimentally obtained signals than the ones generated by the official context-independent pore model.
- so that they can obtain the reads with different accuracies ranging from 83 to 97%.
- Two case studies demonstrate the application of DeepSimulator to benefit the development of tools in de novo assembly and in low coverage SNP detection.

### • SiLiCO

- SiLiCO the first open source package for in silico simulation of long read sequencing results on both major long read sequencing platforms.
- SiLiCO simulates both PacBio and, for the first time, Oxford Nanopore read sequencing results by sto-chastically generating genomic coordinates and extracting corresponding nucleotide sequences from a reference assembly.
- SiLiCO also is easily scaled up to a Monte-Carlo simulation, affording the end user the ability to construct empirical distributions of various genomic features.
- SiLiCO is an open source package written in Python. It is freely available at <https://www.github.com/ethanagbaker/SiLiCO> under the GNU GPL 3.0 license.