UNIVERSITY OF SOUTH FLORIDA

Major Research Area Paper Presentation

A Survey on NGS Read Mapping: The Current State of Algorithms and High-Performance Implementations

by

Minh Pham

For the Ph.D. degree in Computer Science and Engineering

Next-Generation Sequencing (NGS), also known as Massively Parallel Sequencing, has been an important tool that has led to many innovations and discoveries. The sequencing platforms typically produce short read length, high coverage, and high-throughput data. These characteristics introduce significant challenges in efficiently analyzing the enormous amount of NGS data. Mapping the short reads to a reference sequence is usually the first step in a NGS data analysis pipeline. Since 2005, many read-mapping software packages have been created for mapping NGS short reads to a reference sequence. This study serves two purposes. First, we review the data structures and algorithms proposed in the literature that enable the efficient mapping of short reads. Second, we compare the implementations of the major mapping software packages on the many-core and many-node computing platforms in terms of performance and hardware requirements.

Wednesday April 6th, 2022
10:00 AM EST
MS Teams Meeting
THE PUBLIC IS INVITED

<u>Examining Committee</u>
Yicheng Tu, Ph.D., Major Professor
Hao Zheng, Ph.D.
Robert Karam, Ph.D.
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Xinming Ou, Ph.D.
Associate Chair for Graduate Affairs
Computer Science and Engineering
College of Engineering

Sudeep Sarkar, Ph.D.
Department Chair
Computer Science and Engineering
College of Engineering

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