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Intel and Broad Institute Dramatically Improve Speed of Analytics for Genome Analysis Toolkit

Improvement Will Help Accelerate Analysis of Genetic Samples for Cancer, Neurodegenerative Disorders and Cardiovascular Disease

NEWS HIGHLIGHTS

- Broad Institute's new version of the Genome Analysis Toolkit (GATK) has been optimized for Intel® Advanced Vector Extensions found in Intel® Xeon® processor-based servers.
- The Intel AVX-based acceleration is capable of speeding up the main computational kernel and yields three to five times overall improvement in variant discovery.

SANTA CLARA, Calif. & CAMBRIDGE, Mass.--(BUSINESS WIRE)-- [Intel Corporation](#) and the [Broad Institute](#) today announced dramatic improvements in the time it takes to analyze genetic information and detect genetic variants associated with medical conditions. By optimizing the latest version of the Broad's Genome Analysis Toolkit (GATK) 3.1 for Intel® Advanced Vector Extensions (Intel® AVX) in Intel® Xeon®-powered servers, Intel and the Broad were able to achieve three to five times overall improvement in variant discovery to meet the challenges of research and accelerate discovery.

These improvements enable a whole genome to now be analyzed in one day instead of three. Together with new methods, GATK 3.1 can now analyze data sets consisting of tens of thousands of DNA samples – a hundred times improvement over what was previously achievable. The improved speed for variant analysis in large association studies will help enable new medical discoveries never before thought possible for conditions such as cancer, neurodegenerative disorders and cardiovascular disease.

“Through this remarkable partnership with Intel, we’ve been able to significantly reduce the run time for our variant caller – one of the key tools within the GATK,” said Eric Banks, Group Leader of Genome Sequencing and Analysis at the Broad Institute. “We look forward to continuing our collaboration with Intel to improve the quality and performance of the whole GATK pipeline to benefit people worldwide.”

“Intel is privileged to work with the experts at The Broad Institute on solving some of today’s most significant computational bottlenecks that stand in the way of scientific discovery,” said Diane Bryant, senior vice president of Intel’s Data Center Group. “We are committed to tackling ambitious challenges to make personalized medicine a reality for everyone.”

GATK 3.1 is available for academic, noncommercial use through the Broad Institute’s web

site at <http://www.broadinstitute.org/gatk/>. Commercial and for-profit users can license GATK 3.1 through Appistry at <http://www.appistry.com/gatk>.

Broad Institute and Intel Collaboration

As part of a recently formed collaboration between Intel and the Broad Institute's Genomics Platform, Intel helped speed the performance of Broad's GATK software by using Intel AVX. The GATK 3.1 is a new software package developed at the Broad Institute to analyze next-generation re-sequencing data. GATK has tens of thousands of users worldwide, and offers a wide variety of tools, with a primary focus on variant discovery and genotyping as well as strong emphasis on data quality assurance. Its robust architecture, powerful processing engine and high-performance computing features make it capable of taking on projects of any size.

Intel AVX is a 256-bit instruction set extension to Intel® SSE found in Intel platforms ranging from notebooks to servers, and is designed for applications that are highly compute intensive. Intel AVX improves performance, better manages data and is ideally suited for applications like image, audio/video processing, scientific simulations, financial analytics and 3D modeling and analysis.

This achievement is the first of many projects that will reflect the collaboration's long-term goal of improving the quality and performance of the GATK pipeline on Intel servers.

About the Broad Institute of Harvard and MIT

The Eli and Edythe L. Broad Institute of Harvard and MIT was launched in 2004 to empower this generation of creative scientists to transform medicine. The Broad Institute seeks to describe all the molecular components of life and their connections; discover the molecular basis of major human diseases; develop effective new approaches to diagnostics and therapeutics; and disseminate discoveries, tools, methods and data openly to the entire scientific community.

Founded by MIT, Harvard and its affiliated hospitals, and the visionary Los Angeles philanthropists Eli and Edythe L. Broad, the Broad Institute includes faculty, professional staff and students from throughout the MIT and Harvard biomedical research communities and beyond, with collaborations spanning over a hundred private and public institutions in more than 40 countries worldwide. For further information about the Broad Institute, go to <http://www.broadinstitute.org>.

About Intel

Intel (NASDAQ: INTC) is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. Additional information about Intel is available at newsroom.intel.com and blogs.intel.com.

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