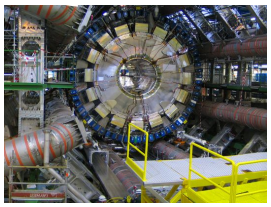
Student programmer wins CERN openlab internship

Marc Saltzman, Special for USA TODAY *9:16 a.m. EST November 16, 2015*



(Photo: CERN)

If you were tasked with choosing the ultimate grand prize for a young coder, what would it be?

A million dollars? Nah. Lunch with PC pioneer Bill Gates? Ho-hum. A job at Facebook? Meh.

Instead, it would likely be an internship at CERN openlab, one of – if not -- the most celebrated scientific research centers on the planet.

Based in Geneva, CERN houses the world's largest particle physics lab, including its underground Large Hadron Collider (LHC), plus it's the birthplace of the World Wide Web and home to CERN openlab, a renowned facility that encourages experimentation and collaboration to solve data-intensive challenges.

Mathieu Gravey, a 25 year-old university student in France, has won this coveted grand prize from the Intel Modern Code Developer Challenge, in partnership with CERN openlab.

"This is very, very exciting," says Gravey, in a Skype video interview with USA TODAY. "It's the opportunity for me to enter and work in one of the most famous international research centers."

"I hope to meet interesting scientists, while acquiring and developing new skills under them," adds Gravey. "Data analytics and simulation through cutting edge technologies are key fields of study for years to come."

The challenge

Available only to students, this international coding contest challenged students to optimize code used to simulate brain development.

In particular, the software focuses on simulating the development of a normal and diseased brain, in order to identify the causes and potential treatments for neurodevelopmental brain disorders, such as epilepsy, autism, and schizophrenia.

This code is part of an existing CERN openlab research project, in collaboration with Newcastle University in the UK, which uses a "parallel programming" framework to help accelerate research among multiple scientists.

Students who entered the Intel Modern Code Developer Challenge were tasked with optimizing the code to improve its runtime performance, allowing researchers to make life-changing scientific breakthroughs faster.

Out of the roughly 2,000 students, representing 130-odd universities across 19 countries, Gravey submitted the fastest optimized code to win the 9-week internship at CERN openlab in 2016.

"Brain simulation is very interesting and it might be the future of informatics," says Gravey. "Nowadays, smart processes are developing faster than ever before; the link between computer and biology is also getting stronger."

Gravey maintains his biggest challenge was "diving into code that you haven't written, plus this kind of algorithm is out of my field of study. These optimizations were performed through an iterative process."

Perhaps he's just being modest: according to Intel, Gravey improved the performance of the code by a whopping 32,000 percent -- from 45 hours to just over 8 minutes.

While the internship was the Grand Prize, 1st place winners earned a trip for a guided tour of CERN, while 2nd place winners get a trip to the 2016 Supercomputing Conference in Austin, Texas, where all winners were announced at this year's event on Saturday.

The impact

"Young people bring new perspectives, enthusiasm and sources of inspiration to the technical development program," says Maria Girone, who leads multiple experimental programs at CERN, which spans across more than 70 computing centers on five continents.

"The CERN openlab summer student program is an excellent way to train the next generation of computer scientists, some of whom will join CERN for longer periods of time -- as technical students, fellows or staff, for instance -- to tackle future challenges," says Girone, who will take over the role of CERN openlab Chief Technology Officer beginning in January.

CERN openlab's current CTO Fons Rademakers says partners like Intel give CERN's scientists early access to tomorrow's technology. "And for our partners, the testing and feedback provided by running their prototypes in CERN's demanding environment can help correct possible design mistakes and help improve or better understand the product."

“The CERN openlab summer student program brings young undergraduate students in contact with the latest and most advanced technologies, but also lets them work for nine weeks in a fast-paced, high-intensity, international environment, among world renowned scientists and engineers.”

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