Go on a particle quest at the first CERN hackfest

An Android-based cosmic ray detector, an open data initiative, a browser-based LHC dashboard and a standard infographic for the standard model... just some of the innovations to come out of the 2012 CERN Summer Student Webfest.

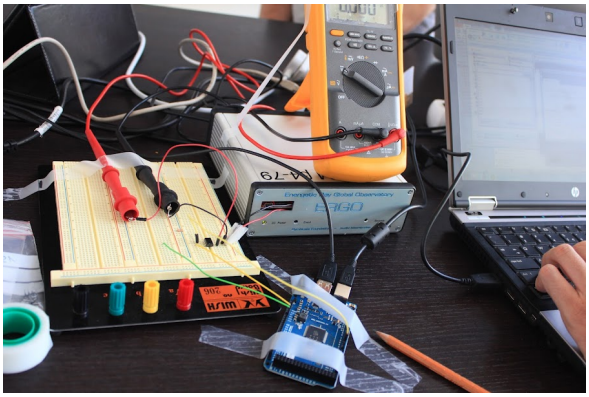

Image courtesy Daniel Lombraña González

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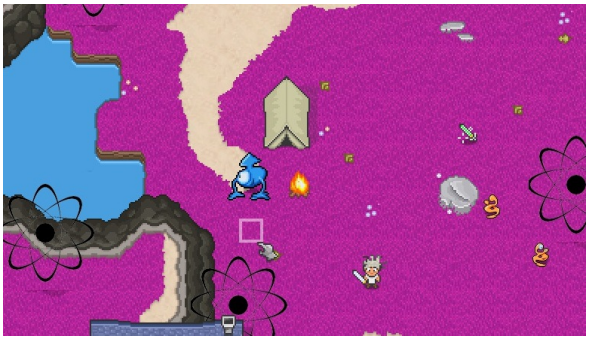
From 3-5 August, CERN played host to its very first hackfest. Organised by the Citizen Cyberscience Centre (CCC) and the Peer 2 Peer University, the

2012 CERN Webfest saw pizza-fuelled summer students hacking their way almost non-stop through an entire weekend to produce a host of weird and wonderful innovations. As each of the teams raced against time in the hope of winning the grand prize of a trip to the Mozilla festival in London, sleep was hard for the students to come by, but fortunately great ideas weren't.

Projects dreamt up by the students included a browser-based dashboard for the Large Hadron Collider (LHC), a new CERN open-data initiative, and a virtual world for the LHC@home platform. However, the highlight of the event was the ParticleQuest game, which was selected by a panel of judges as the weekend's overall winning project.



Hunt the Higgs in ParticleQuest

ParticleQuest, which can be played online here, is a hack of Mozilla's new open-source game BrowserQuest. According to the game's storyline, a meltdown at the LHC has led to the particles which make up the standard model of physics escaping from CERN (not to mention expanding to human proportions and gaining the ability to speak) and now it's your job, armed only with your trusty

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~~sword~~ electron neutrino to hunt them down and stop them wreaking havoc. Dodgy backstory aside, the game's main aim is to educate. Each of the particles have had charming sprites created for them by graphic designer André -Pierre Olivier and when you encounter them in the game they'll even tell you a little bit about themselves. "These beautiful graphics were the real inspiration behind the project," explains team-member Alejandro Avilés, who goes by the pseudonym 'OmeGak' online. "Each of the designs reflects the actual behaviour of the particle represented - it's really amazing."

Image courtesy André-Pierre Olivier

Other highlights from the weekend include an Android-based cosmic ray detector, which you can read about in detail here, and an attempt to create a standard infographic for the standard model. This project was inspired by the announcement of the

discovery of a particle consistent with the Higgs boson on 4 July. However, the project went much further than simply adding a slot for the Higgs boson to the usual representations of the standard model. Instead, the group sought to make their infographic as informative as possible, with additional information about each particle contained within each cell - along the lines of the periodic table of elements. This is what they came up with:

A standard infographic for the standard model

Francesca Valery Day, one of the students who worked on this project explained that the team was aiming to "explain the standard model from the beginning in an intuitive order for someone who doesn't know any maths or physics in a way that's fun and interactive."

Of course, this being a hackfest, the team weren't satisfied with merely creating a brand-new infogrpahic to revolutionise the way the most fundamental concepts in modern physics are taught. Rather, they went on to produce a suite of interactive Feynman diagrams, which can be accessed in a web browser and also be used as a learning tool. "Feynman diagrams are a really great way of understanding the standard model without having to know any maths or any quantum mechanics," explains Day. "You can literally see what's going on."

Francois Gray of the CCC, who helped to organise the event said: "I was really impressed by the students enthusiasm - many of them stayed up most of the night to get their hack done - and by the creativity they have shown... I mean, we're talking about some of them doing browser-based Feynman diagrams, I'm sure no-one's even dreamed of doing that kind of thing before."

The CERN Webfest was sponsored by the Mozilla Foundation and the Shuttleworth Foundation. The source code used for all of the projects has also been made available on GitHub, so work can continue and new contributors can join in the fun.

- Andrew Purcell

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