

Steps into Space - Commercialisation, Occupation, Colonization

There are advances being made almost daily in the disciplines required to make space and its contents accessible. This blog brings together a lot of that info, as it is reported, tracking the small steps into space that will make it just another place we carry out normal human economic, leisure and living activities.



Tuesday, 21 July 2015

Flavours of Physics: Join the LHCb machine-learning contest

Cian O'Lunaigh

In a [machine-learning challenge](#) organised by CERN and Yandex Data Factory (a data-analytics division of Russia's leading web search provider Yandex), and hosted by the data-science website Kaggle, [LHCb](#) physicists invite you to help them investigate a rare phenomenon in particle physics for the chance to win up to \$7000. The phenomenon in question? Charged-lepton flavour violation.

Leptons are subatomic particles that, together with quarks, help to make up visible matter. But unlike quarks, leptons do not take part in strong interactions. The leptons comprise the electron, the muon, the tau and the neutrinos, and their "flavour" are related to their type.

In the [Standard Model](#) of particle physics, if two or more particles have identical interactions, then they may be interchanged without affecting the physics. This is known as symmetry.

Lepton flavour is one such possible symmetry. If the symmetry exists in a particle interaction, then the numbers of electrons and electron-neutrinos, muons and muon-neutrinos, and taus and tau-neutrinos should be separately conserved - they should each remain the same. But in many proposed extensions to the Standard Model this lepton-flavour symmetry doesn't exist, and particle decays that do not conserve lepton flavour are possible.

One decay that physicists are searching for at the LHC is where a [tau particle decays to three muons](#). Observation of this decay would be a clear indication of the violation of lepton flavour and a sign of long-sought "new physics".

And that's when you come in. Using real data from the LHCb experiment at CERN, mixed with simulated datasets of the decay, your task is to classify events into "tau decay to three muons" versus "background." No knowledge of particle physics is required.

Participants can [download the LHCb data](#) from Kaggle, then build a statistical model using whichever tools they prefer, and upload their code to Kaggle, which scores the solution and shows it on a leaderboard. Participants with the best score and who meet the eligibility criteria detailed in the competition rules will be awarded \$7000, \$5000 and \$3000 for first, second and third place respectively. The winning method may eventually be applied to real data and the winners may be invited to follow-up workshop to discuss their results with high-energy physicists.

The first submission deadline is 5 October 2015. This challenge is sponsored by Yandex and Intel. Both companies are members of CERN openlab.

via CERN: Updates for the general public

<http://home.web.cern.ch/about/updates/2015/07/flavours-physics-join-lhcb-machine-learning-contest>

Posted by [Mark Highton Ridley](#) at 12:05



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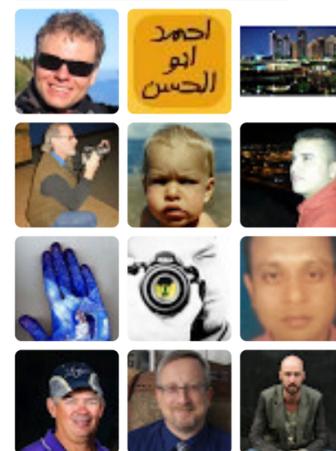
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