

# Physics Prize Flavours of Physics Challenge



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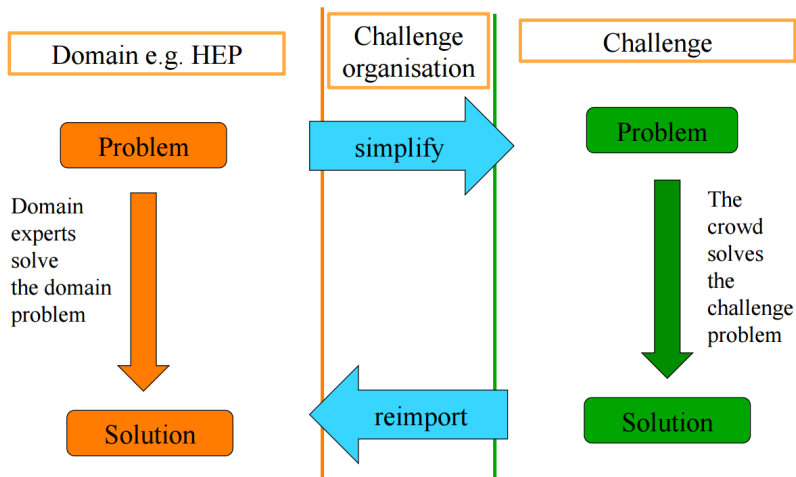
University of  
Zurich<sup>UZH</sup>



Universität Zürich,  
Institute of Nuclear Physics, Polish Academy of Science

NIPS conference, Montreal  
December 11, 2015

# From domain to challenge and back



⇒ Not all solutions can be reimported back to HEP → Physics prize for the ones that can!

# Physics Prize

⇒ HEP meets ML Award

An award will be given to the team that, as judged by the LHCb collaboration members on the organizing committee, creates a model that is the most useful for the LHCb experiment. The selection criteria include:

- The simplicity/straightforwardness/originality of the approach.
- The computing requirements (CPU and memory demands).
- The suitability for use in production.
- The robustness with respect to lack of training statistics.

The winning team will be awarded 2000 \$ and invited to meet the LHCb collaboration physicists at dedicated **workshop** held by University of Zurich on Feb. 18-20, 2016.

We thank Intel for supporting this prize.

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Upgrade:

Due to high level of submitted solutions we decided to increase award

## Other members of the physics prize committee



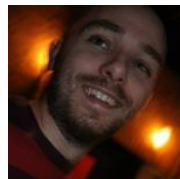
P. Koppenburg



T. Blake



M. Bettler



F. Dettori



A. Ustyuzhanin



T. Likhomanenko

## And the winners are:



**Vincens Gaitan**, R&D director in the Grupo AIA.  
Studied physics and got a PhD in Machine Learning in 1993 with the ALEPH.  
Very good physics understanding of the problem and the tests!

- ⇒ Derived a number of very different approaches (some being hacks) that are well documented in this [blog](#)
- ⇒ Interesting ideas of doping the background training sample with simulated events from other channel, thus forcing the classifier to be less dependent on data-MC differences.

This technique might help in the every analysis where DATA/MC differences are problematic.

## And the winners are:



**Alexander Rakhlin**, self-employed, previously Uniastrum Bank.

Finished National Research University of Electronic Technology (MIET).

⇒ Experience in Machine Learning and Data Analysis applications to business, medicine and science, including but not limited to image recognition, EEG/MRI decoding, Diabetic Retinopathy Detection, **High Energy Physics**.

⇒ This solutions really makes us optimistic as it solves problem that we are usually facing in rare decays:

- Small statistics
- Imperfect MC
- Translating information from control to signal channel.

# Advertisement

- ⇒ The physics winners are invited to the "Heavy Flavour Data mining" workshop at Zurich.
- ⇒ You are ALL INVITED! Please come and help us discover NP.
- ⇒ Register: [LINK](#) .

