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New approaches to the problem of unfolding

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Matrix inversion problems are often encountered in experimental physics, and in particular in high-energy particle physics, under the name of unfolding. The true spectrum of a physical quantity is deformed by the presence of a detector, resulting in an observed spectrum. If we discretize both the true and observed spectra into histograms, we can model the detector response via a matrix. Inferring a true spectrum starting from an observed spectrum requires therefore inverting the response matrix. Many methods exist in literature for this task, all starting from the observed spectrum and using a simulated true spectrum as
a guide to obtain a meaningful solution in cases where the response matrix is not easily invertible.
In this Contribution, I take a different approach to the unfolding problem by exploring several methods of connecting the true to the smeared space, using machine learning techniques; some of these methods outperform current state-of-the art algorithms in problems with a non-trivial null space. Regularization schemes are introduced to treat the case where non-diagonal response matrices result in high-frequency oscillations of the solution in true space, and the introduced bias is studied.

Is this abstract from experiment?

No

Is the speaker for that presentation defined?

Yes

Name of experiment and experimental site

N/A

Internet talk

Yes

Details

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