Model-based and Learning-based Computational Methods: Closing the Gap

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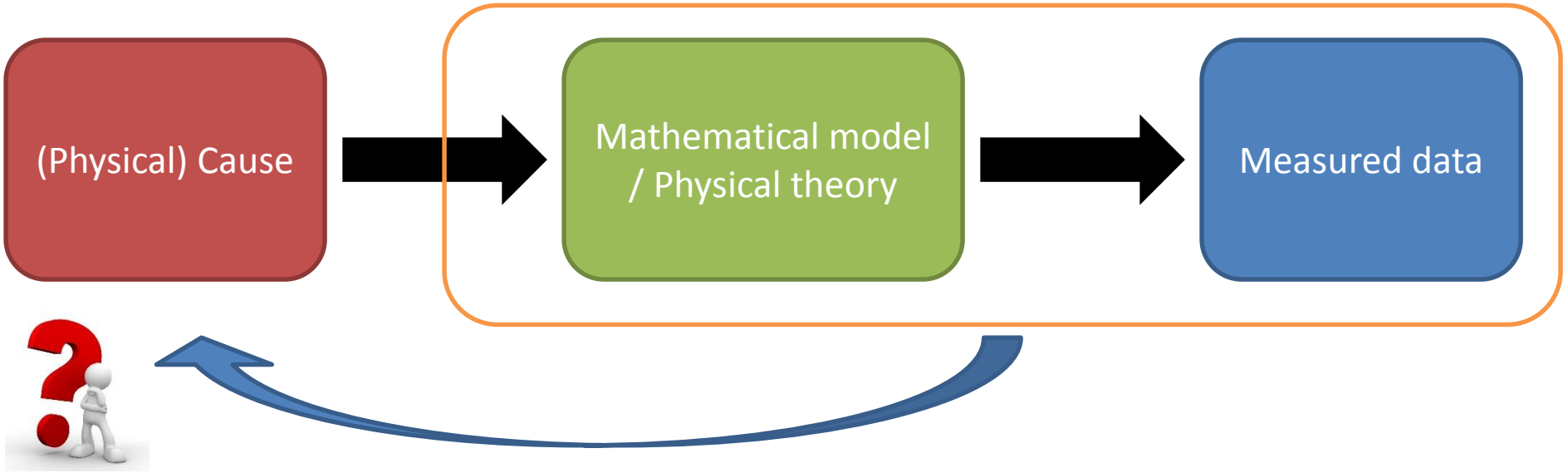
http://www.inspirelab.us

Research Theme 1: Inverse Problems



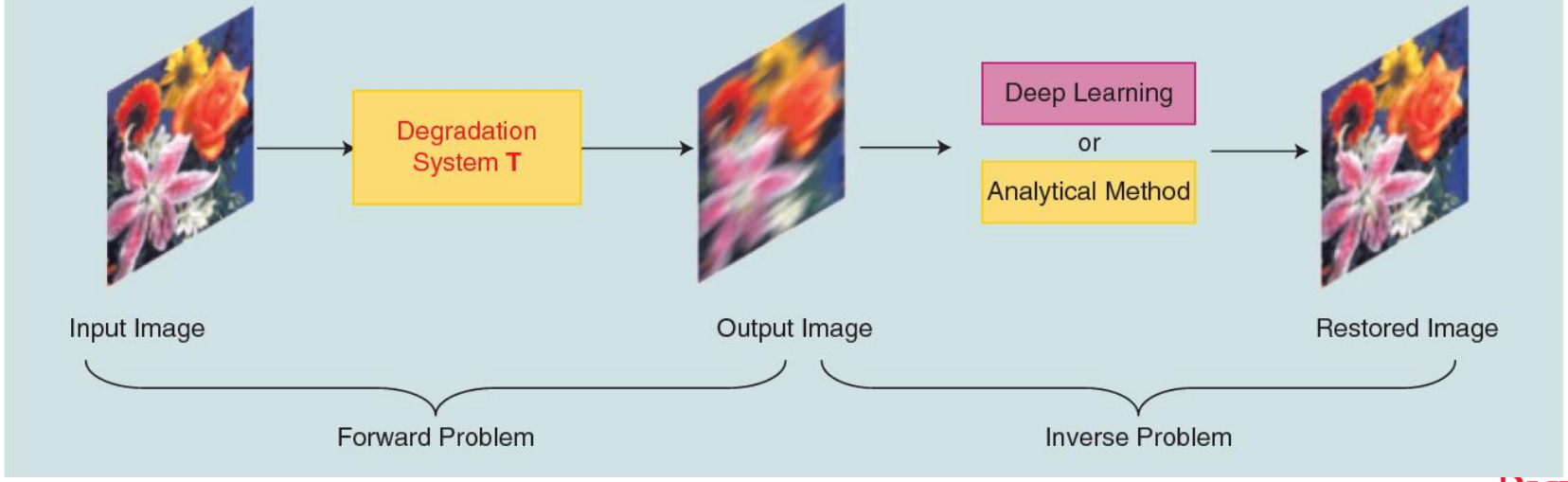
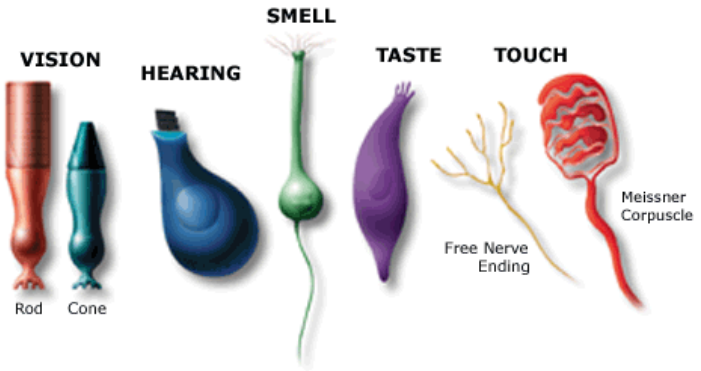
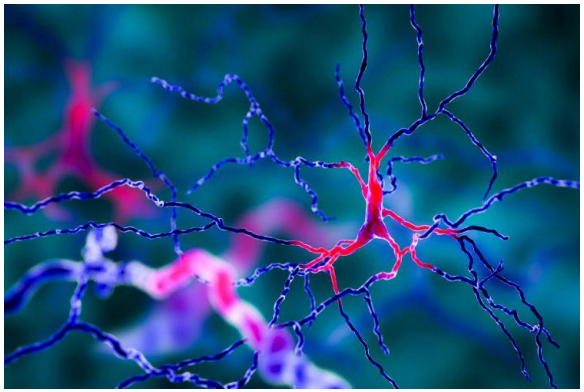


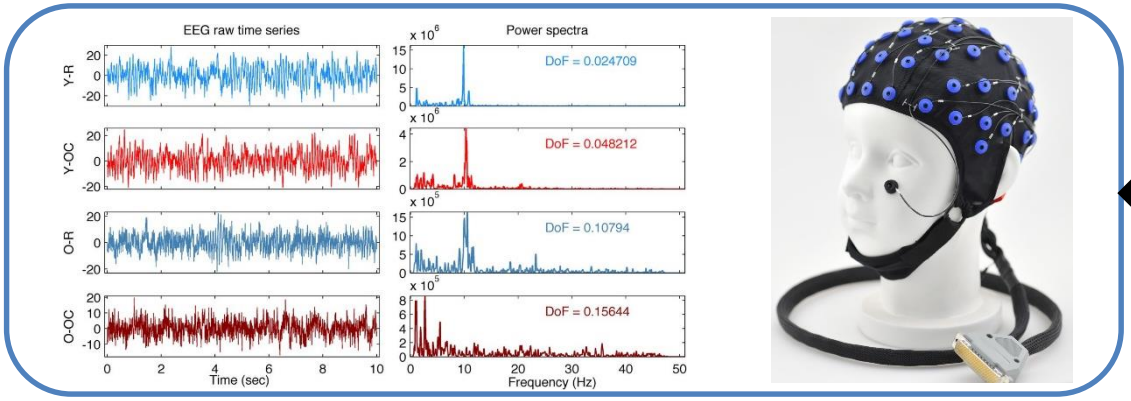
Image: "Using Deep Neural Networks for Inverse Problems in Imaging: Beyond Analytical Methods"

Inverse Problems: Parallels with Dark Matter Direct Detection

Cause







Multichannel Time-series Data

Mathematical Model

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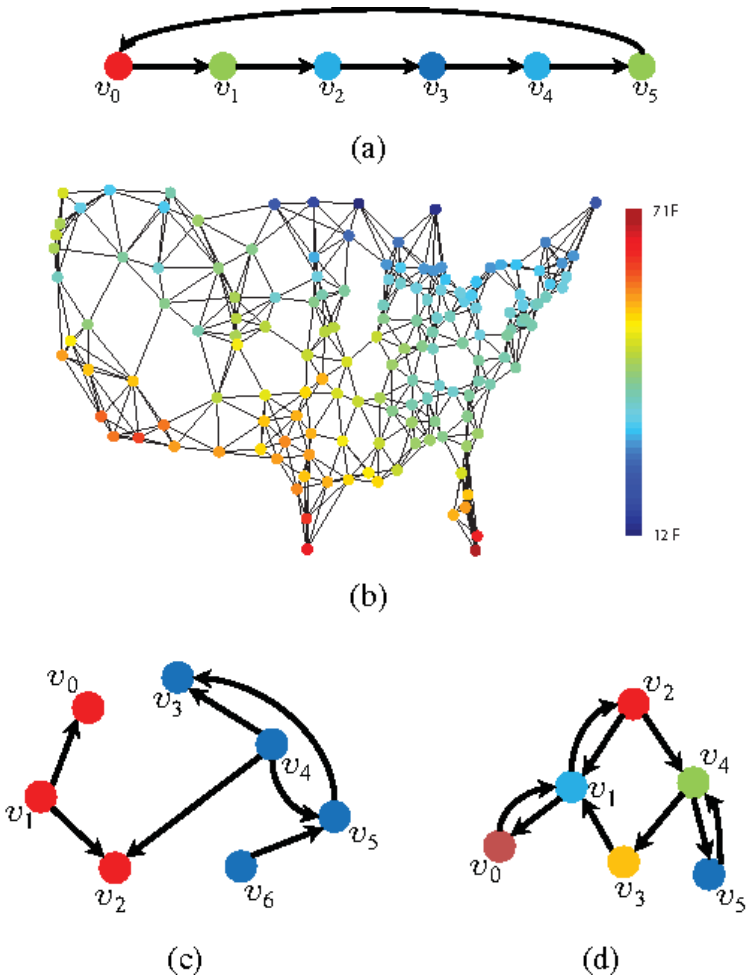
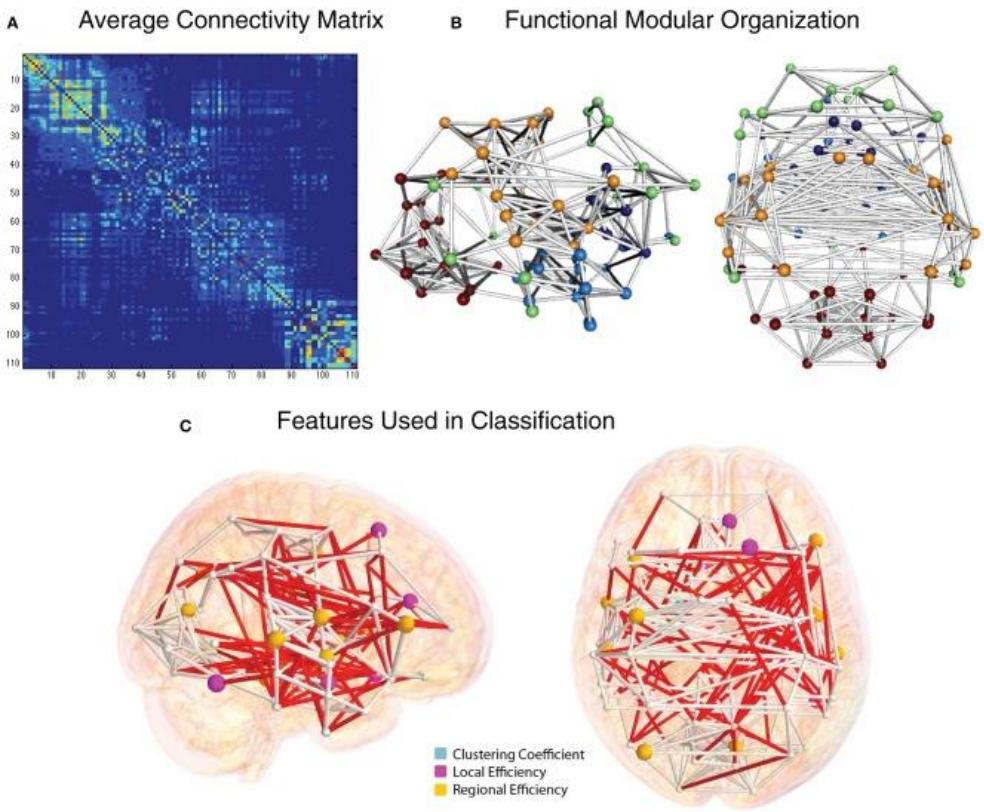
Images taken from Google Images

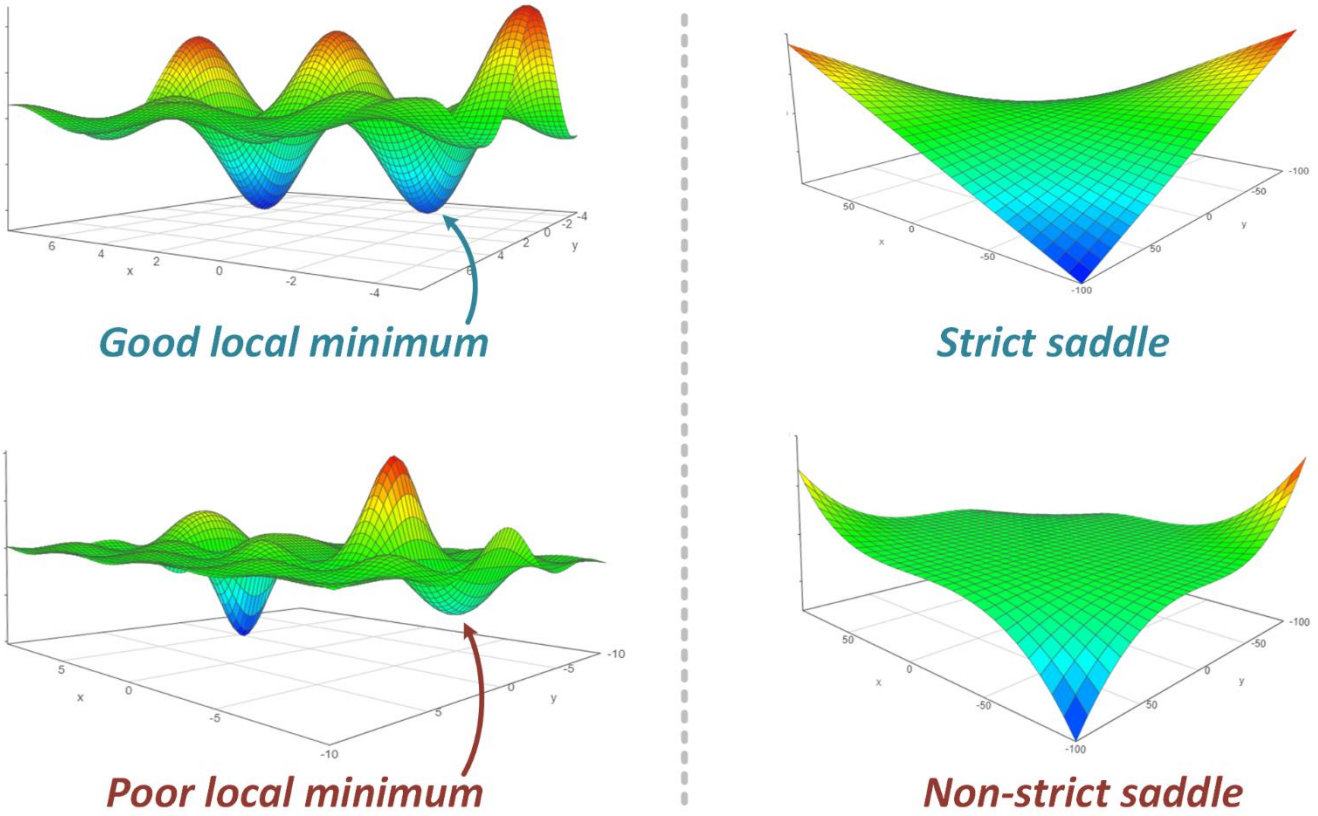
Research Theme 2: Non-Euclidean Data





Left image: “Big Data Analysis with Signal Processing on Graphs: Representation and processing of massive data sets with irregular structure”; Right image: “Insights into multimodal imaging classification of ADHD”

Research Theme 3: Understanding Optimization Landscapes



Landscape analyses prove convergence to global minimum by disqualifying these

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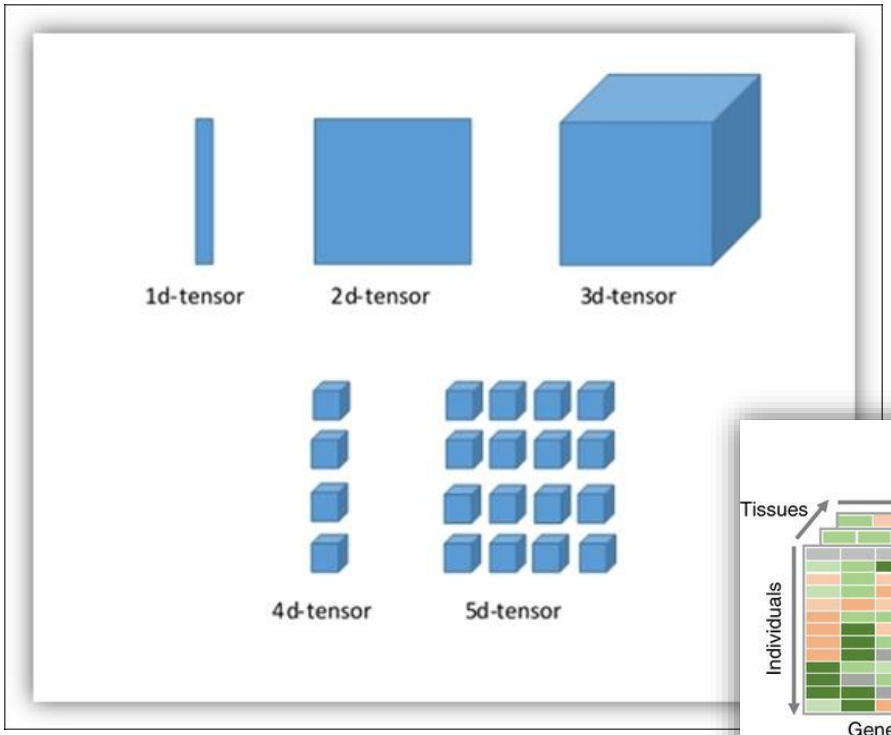
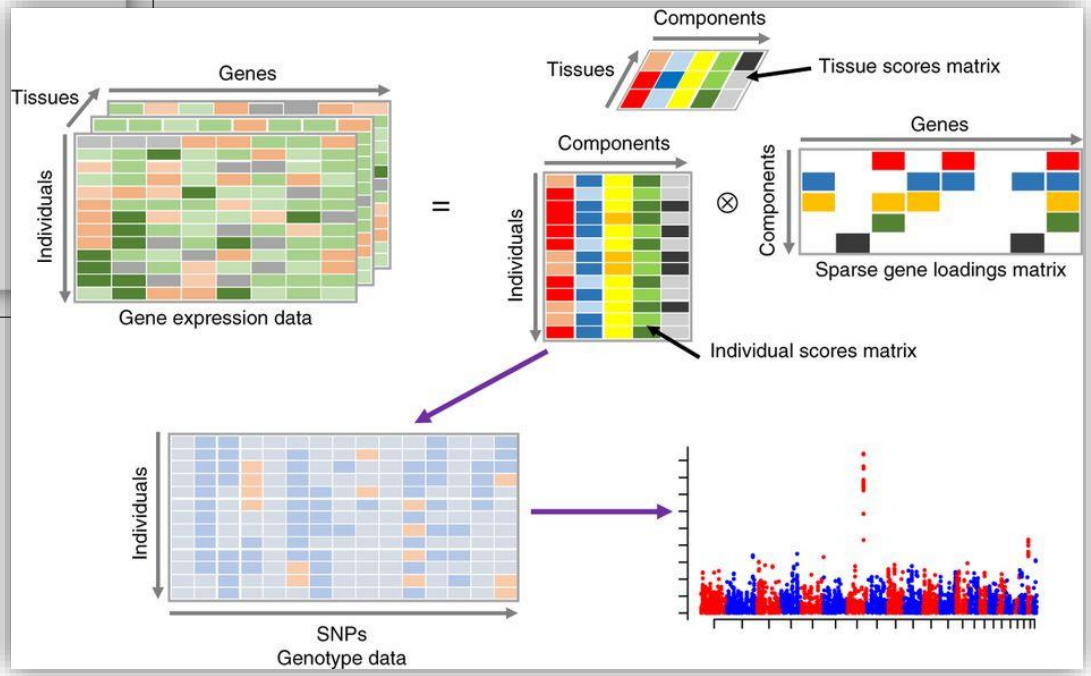
Off the Convex Path Blog: https://www.offconvex.org/2018/11/07/optimization-beyond-landscape/

Research Theme 4: Multidimensional Data





Images taken from Google Images

Research Theme 5: Distributed Machine Learning