

“Density Estimation using Real NVP”

Cons

Haresh Karnan

# Basic framework is not novel !

## NICE: NON-LINEAR INDEPENDENT COMPONENTS ESTIMATION

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### ABSTRACT

We propose a deep learning framework for modeling complex high-dimensional densities called Non-linear Independent Component Estimation (NICE). It is based on the idea that a good representation is one in which the data has a distribution that is easy to model. For this purpose, a non-linear deterministic transformation of the data is learned that maps it to a latent space so as to make the transformed data conform to a factorized distribution, i.e., resulting in independent latent variables. We parametrize this transformation so that computing the determinant of the Jacobian and inverse Jacobian is trivial, yet we maintain the ability to learn complex non-linear transformations, via a composition of simple building blocks, each based on a deep neural network. The training criterion is simply the exact log-likelihood, which is tractable. Unbiased ancestral sampling is also easy. We show that this approach yields good generative models on four image datasets and can be used for inpainting.

# Chapter 3

Includes redundant information from previous publication

- Model Definition
- Coupling layer
- Properties
- Combining layers

NVP extends the building blocks and uses more recent tricks like BatchNorm, in a way that ends up being highly successful in bringing impressive performance.

# Comparison with MLP

- Could have compared with multilayer perceptrons.
- Computational tradeoffs against related methods.

*That's all Folks!*