CDE with Normalizing Flows

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August 2019

- The paper employs normalizing flows as a flexible likelihood model for fitting them to complex densities by placing a prior over conditional density estimators using variational Bayesian neural networks. To this end they map features, x, to the parameters of a normalising flow defining the conditional density, $p(y|x)$.
- **A new parameterization of radial flows** They developed an alternative parameterization of radial flows (Rezende Mohamed, 2015) with which one can more readily express priors over distributions:

$$f(z) = z + \frac{\alpha\beta(z-\gamma)}{\alpha|z-\gamma|}$$

In the conditional setting, $\alpha(x), \beta(x)$ and $\gamma(x)$ can be modeled as Neural Networks - trained by variational Bayesian approximation - taking x as input:

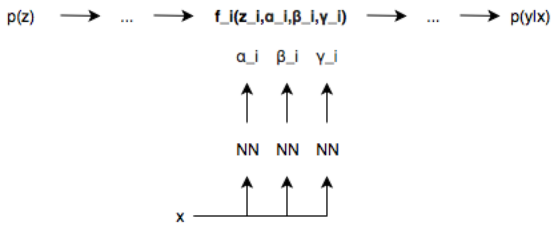

Figure 1: Caption

- **Take Away.** Models for CDE are often split into homoscedastic and heteroscedastic models. They did this by introducing an additional hyperparameter, λ, which defines a multiplicative scaling of the final layer weights (but not biases). For example, when these weights are small, the parameters of conditional distributions will vary only slightly from their biases.