Tree Density Approximation

1 Why

Can we approximate a density by a tree density in a similar manner to how we handled distributions?

2 Definition

Tree density approximation is an optimization problem in which we select a tree density whose entropy relative to a given density is minimal.

2.1 Notation

Let $g : \mathbf{R}^n \to \mathbf{R}$ be a density. Let d denote the differential relative entropy. We want to

$$
\begin{aligned}
&\textbf{find} && \text{density } f \text{ and tree } T \text{ on } \{1, \ldots, n\} \\
&\textbf{minimizing} && d(g, f) \\
&\textbf{subject to} && f \text{ factors according to } T.
\end{aligned}
$$