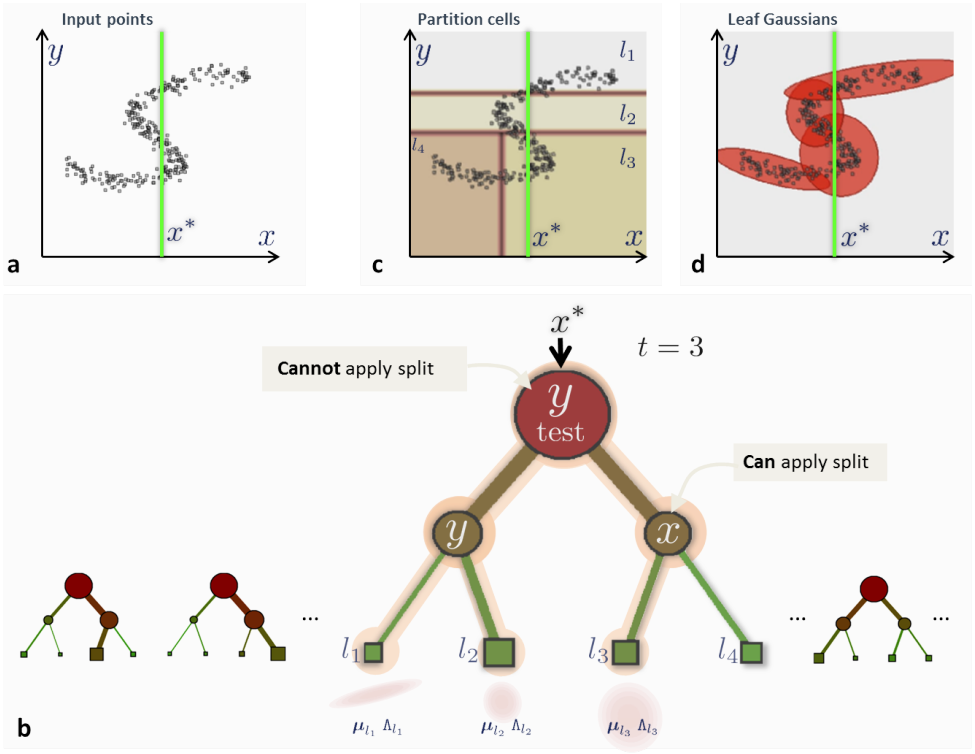

Fig. 5.12: **Regression from density forests. (a)** 2D training points are shown in black. The green vertical line denotes the value x^* of the independent variable. We wish to estimate $p(y|x = x^*)$. **(b)** When testing a tree on the input x^* some split nodes cannot apply their associated split function and the data is sent to both children (see orange paths). **(c)** The line $x = x^*$ intersects multiple cells in the partitioned feature space. **(d)** The line $x = x^*$ intersects multiple leaf Gaussians. The conditional output is a combination of those Gaussians.

$\int_y p_t(y|x = x^*)\, dy = 1$, and can be computed as follows:

$$Z_{t,x^*} = \sum_{l \in \mathcal{L}_{t,x^*}} \pi_l \left(\phi_{t,l}(y_l^{\mathsf{T}}|x = x^*) - \phi_{t,l}(y_l^{\mathsf{B}}|x = x^*) \right)$$