Labeled data
$$\mathcal{D} = \{(x_i, y_i)\} \subset \mathbb{X} \times \mathbb{Y} \\ x_i \in \mathcal{D}_x \text{ data samples} \\ y_i \in \mathcal{D}_y \text{ labels} \\ \mathbf{x} = [x_i] \\ \mathbf{y} = [y_i]$$
 Supervised Machine Learning $\mathbf{y} = f(x; w)$ $\mathbf{y} = f(x; w)$

Model purpose - Regression

- ► The model f shall map $x \mapsto y$ and approximate an unknown function $\hat{f} \cdot \mathbb{X} \longrightarrow \mathbb{Y}$
- $ightharpoonup v_i \in \mathbb{Y} \subseteq \mathbb{R}^{n_y}$
- ► Examples: data-driven modeling, energy forecasting, ...