

# 1 Notation

The notation used throughout this thesis is summarized below

- $x$ : A scalar
- $\mathbf{x}$ : A vector
- $\mathbf{X}$ : A matrix
- $\mathbf{x}_i$ : The  $i$ th element of a vector  $\mathbf{x}$
- $\mathbf{X}_{ij}$ : The  $j$ th element in the  $i$ th row of matrix  $\mathbf{X}$
- $\mathbb{R}$ : The set of real numbers
- $\mathbb{R}^n$ : The set of  $n$ -dimensional vectors of real numbers
- $\mathbb{R}^{n \times m}$ : The set of  $n \times m$ -dimensional matrices of real numbers, where  $n$  is the amount of rows and  $m$  is the amount of columns
- $|\cdot|$ : Cardinality
- $\nabla f$ : Gradient of  $f$
- $\frac{\partial y}{\partial x}$ : Partial derivative of  $y$  with respect to  $x$
- $\mathcal{O}$ : Big O-notation
- $\odot$ : Element-wise multiplication
- $\mathcal{N}(\mu, \sigma^2)$ : Normal/Gaussian distribution with mean  $\mu$  and standard deviation  $\sigma^2$
- $D(a, b)$ : Arbitrary distance function between  $a$  and  $b$