

# Notation

Unbolded  $x$  represents a single number, while boldface  $\mathbf{x}$  represents a vector, and capital boldface  $\mathbf{X}$  represents a matrix. An individual element of a vector is denoted with a subscript and without boldface. For example, the  $i$ th element of a vector  $\mathbf{x}$  is  $x_i$ . A bold lower-case letter with an index such as  $\mathbf{x}_j$  represents a particular row of matrix  $\mathbf{X}$ .

Symbol	Description
SE	The squared-exponential kernel, also known as the radial-basis function (RBF) kernel, or the Gaussian kernel.
RQ	The rational-quadratic kernel.
Per	The periodic kernel.
Lin	The linear kernel.
WN	The white-noise kernel.
C	The constant kernel.
$\sigma$	The changepoint kernel, $\sigma(x, x') = \sigma(x)\sigma(x')$ , where $\sigma(x)$ is a sigmoidal function such as the logistic function.
$k_a + k_b$	Addition of kernels, shorthand for $k_a(\mathbf{x}, \mathbf{x}') + k_b(\mathbf{x}, \mathbf{x}')$
$k_a \times k_b$	Multiplication of kernels, shorthand for $k_a(\mathbf{x}, \mathbf{x}') \times k_b(\mathbf{x}, \mathbf{x}')$
$k(\mathbf{X}, \mathbf{X})$	The Gram matrix, whose $i, j$ th element is $k(\mathbf{x}_i, \mathbf{x}_j)$ .
$\mathbf{K}$	Shorthand for the Gram matrix $k(\mathbf{X}, \mathbf{X})$
$\mathbf{f}(\mathbf{X})$	A vector of function values, whose $i$ th element is given by $f(\mathbf{x}_i)$ .
$\text{mod}(i, j)$	The modulo operator, giving the remainder after dividing $i$ by $j$ .
$\mathcal{O}(\cdot)$	The big-O asymptotic complexity of an algorithm.

Exact definitions of all kernels listed here are given in ??.