



## Positive Definite Matrices

### 1 Why

### 2 Definition

A matrix  $A$  is *positive definite* if all quadratic forms with the same vector on each side are positive.

#### 2.1 Notation

Let  $A \in \mathbf{R}^{d \times d}$ .  $A$  is positive definite if for every  $x \in \mathbf{R}^d$ ,  $x^T A x > 0$ . We denote the set of real-valued positive definite  $d$  by  $d$  matrices by  $\mathbf{S}_{++}^d$ .