Chairing #Definition

The ***Rayleigh Quotient*** states that, for a symmetric matrix $M^{n\times n}$ and a non-zero vector v^n, we can make a function $R(M, v)$ that measures the "scaled energy" of v relative to M and is defined as:

$$R(M, v) = \frac{v^T M v}{v^t v}$$

It also states we can bound the Quotient as:

$$\lambda_{\min}(M) \leq R(M, v) \leq \lambda_{\max}(M),\ \forall v \neq_0$$