

We can also use

$$M(K) := \left\{ Y \in \Sigma^{n+1} : \text{diag}(Y) = Y e_0; u^T Y v \geq 0 \quad \begin{matrix} \forall u \in Q^* \\ \forall v \in K^* \end{matrix} \right\}$$

$$N(K) := \{ Y e_0 : Y \in M(K) \}$$

$$N(P) := \left\{ x \in \mathbb{R}^n : \begin{pmatrix} 1 \\ x \end{pmatrix} \in N(K) \right\}.$$

Then

$$P_I \subseteq N_+(P) \subseteq N(P) \subseteq P.$$

If K is polyhedral then optimizing a linear function over $M(K)$ is solving an LP.