

Successive SDP Relaxation Method

0. $k := 0$

1. If $C_k = \emptyset$ or $C_k = \text{conv}(F)$ then STOP

2. Choose a semi-infinite quadratic inequality representation \mathcal{P}_k for C_k .

3. $C_{k+1} := \hat{F}(\mathcal{P}_F \cup \mathcal{P}_k)$

$$= \left\{ x \in \mathbb{R}^n : \begin{array}{l} \exists X \in \Sigma^n \text{ s.t. } \begin{pmatrix} 1 & x^T \\ x & X \end{pmatrix} \in \Sigma_{+}^{n+1} \\ \text{and } p \cdot \begin{pmatrix} 1 & x^T \\ x & X \end{pmatrix} \leq 0, \forall p \in (\mathcal{P}_F \cup \mathcal{P}_k) \end{array} \right\}$$

4. $k := k+1$, Go TO Step 1.