

$$line : m_k^{(i)} := \sqrt{\sum_{j \in \mathcal{N}^{(i)}} (|s_k^{(ij)} - (g_k^{(i)})^T v_k^{(ij)}| + a_k^{(ij)})^2 \mathcal{E}_k^{(i)}} := \left\{ x \in \mathbb{R}^d \mid \left\| \frac{A_k^{(i)}(x - g_k^{(i)})}{m_k^{(i)}} \right\|^2 \leq 1 \right.$$

$$\mathrm{norm}_s tr :$$