

# PROGETTAZIONE MATRICE GUADAGNO

$L : (A(\alpha) - LC)$  quadraticamente stabile

$$\forall \alpha \in \Lambda_N$$

$$A(\alpha) = \sum_{i=1}^N \alpha_i A_i \quad \alpha \in \Lambda_N$$

$$\alpha_1 + \dots + \alpha_N = 1$$

$$\alpha_i \geq 0 \quad i=1, \dots, N$$

$$(A(\alpha) - LC)^T S (A(\alpha) - LC) - S < 0, \quad S > 0 \quad \forall \alpha \in \Lambda_N$$

$$\Updownarrow$$

$$-S - (A(\alpha) - LC)^T S (-S)^{-1} S (A(\alpha) - LC) < 0, \quad S > 0 \quad \forall \alpha \in \Lambda_N$$

$$\Updownarrow \text{ Schur}$$

$$\begin{bmatrix} -S & S(A(\alpha) - LC) \\ (A(\alpha) - LC)^T S & -S \end{bmatrix} < 0, \quad S > 0 \quad \forall \alpha \in \Lambda_N$$

$$\Updownarrow \quad SL \triangleq \mathbb{Z}$$

$$D_i \triangleq \begin{bmatrix} -S & SA_i - \mathbb{Z}C \\ A_i^T S - \mathbb{Z}^T C^T & -S \end{bmatrix} < 0, \quad S > 0 \quad i=1, \dots, N$$