Modélisation Papier

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1. Voici le problème statique $(\mathcal{P})$:

$$(\mathcal{P}) \begin{cases} \min \quad \sum_{(i,j)\in A} d_{ij}\, x_{ij} \\ \text{s.c.} \\ \qquad \sum_{(i,j)\in A} p_i\, x_{ij} \leq S - p_t \\ \qquad \sum_{j\in\delta^+(i)} x_{ji} \ - \sum_{j\in\delta^-(i)} x_{ij} = 0 \quad \forall i \in A \setminus \{s,t\} \\ \qquad \sum_{j\in\delta^-(s)} x_{sj} = 1 \\ \qquad \sum_{j\in\delta^+(t)} x_{jt} = 1 \end{cases}$$

2. Modélisation du problème robuste $(\mathcal{P}_r)$:

$$(\mathcal{P}_r) \begin{cases} \min_x \max_{\delta^1} \quad \sum_{(i,j)\in A} d_{ij}\, (1+\delta^1_{ij})\, x_{ij} \\ \text{s.c.} \\ \qquad \sum_{(i,j)\in A} p_i\, x_{ij} + \max_{\delta^2} \left\{ \delta^2_t \hat{p}_t + \sum_{(i,j)\in A} \delta^2_i\, \hat{p}_i\, x_{ij} \right\} \leq S - p_t \\ \qquad \sum_{j\in\delta^+(i)} x_{ji} \ - \sum_{j\in\delta^-(i)} x_{ij} = 0 \quad \forall i \in A \setminus \{s,t\} \\ \qquad \sum_{j\in\delta^-(s)} x_{sj} = 1 \\ \qquad \sum_{j\in\delta^+(t)} x_{jt} = 1 \end{cases}$$