Sellar Problem

$$\min \quad f(x_2, x_3, y_1, y_2) = x_2^2 + x_3 + y_1 + e^{-y_2}$$

$$\text{s.t.} \quad g_1(y_1) = y_1/8 - 1 \geq 0$$

$$g_2(y_2) = 1 - y_2/10 \geq 0$$

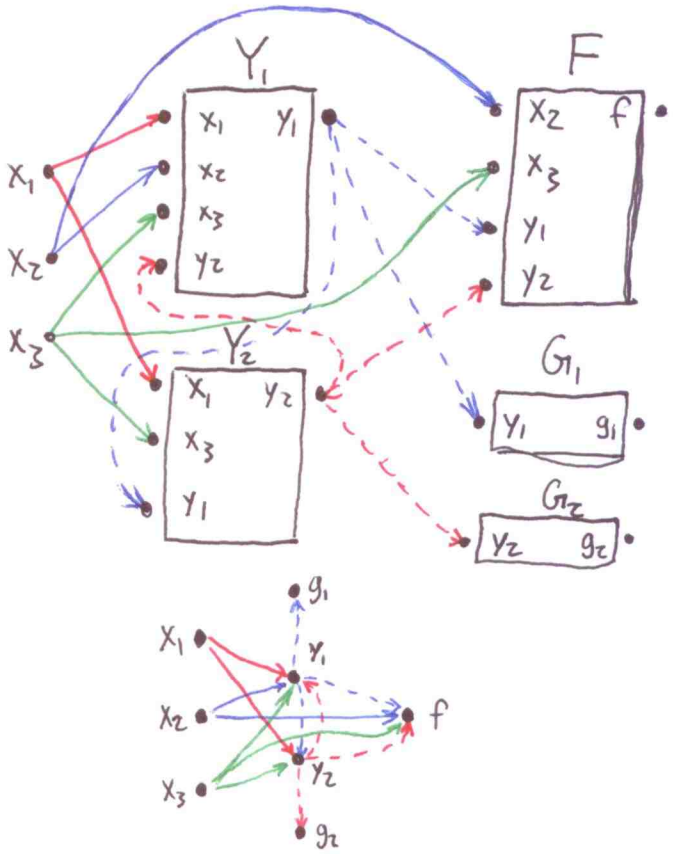
$$-10 \leq x_1 \leq 10$$

$$0 \leq x_2 \leq 10$$

$$0 \leq x_3 \leq 10$$

$$\text{where} \quad y_1 = x_1^2 + x_2 + x_3 - 0.2\, y_2$$

$$y_2 = \sqrt{y_1} + x_1 + x_3$$



Scalable Problem

$$\min \quad f(z, y_1, y_2, y_3) = z^T z + \sum_{i=1}^{3} y_i^T y_i$$

$$\text{s.t.} \quad g_i = 1 - \frac{y_i}{c_i} \leq 0, \; i = 1, 2, 3$$

$$-10 \leq z \leq 10$$

$$-10 \leq x \leq 10$$

$$\text{where} \quad y_i = -\frac{1}{c_{y_i}} \left(c_z z + c_{x_i} x_i - c_{y_i} y_i \right),$$

$$i = 1, 2, 3$$