Service Center Optimization (Nonlinear Integer Programming)

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Question: Is there any fast algorithm to solve the following problem?

Problem: Let

1. the ideal number of service centers in the region of level 1-5 be $X_1, X_2, X_3, X_4, X_5$
2. the current number of service centers of level 1-5 be $N_1, N_2, N_3, N_4, N_5$
3. the capability of service center of level 1-5 be $a_1, a_2, a_3, a_4, a_5$
4. the unit cost of the capability of service centers of level 1-5 be $C_1, C_2, C_3, C_4, C_5$
5. the total capability of service centers in the region should be in $[D_{min}, D_{max}]$
6. the total number of service centers of competitor in the region is $N'$

The ideal structure of service centers in the region should satisfy:

1. Total capability fits the service demand
2. Total of number of service centers match competitors’ level in some sense
3. The level structure match some pre-defined proportion, $p_1 : p_2 : p_3 : p_4 : p_5$
4. Total service cost if low
5. The change to current structure is small

This can be written as the following optimization problem:

- $D_{min} <= a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 <= D_{max}$
- $P_{min} N' <= X_1 + X_2 + X_3 + X_4 + X_5 <= P_{max} N'$
- $X_1 : X_2 : X_3 : X_4 : X_5 \approx p_1 : p_2 : p_3 : p_4 : p_5$
- $Min \left\{ \left( \frac{X_1 - N_1}{N_1} \right)^2 + \left( \frac{X_2 - N_2}{N_2} \right)^2 + \left( \frac{X_3 - N_3}{N_3} \right)^2 + \left( \frac{X_4 - N_4}{N_4} \right)^2 + \left( \frac{X_5 - N_5}{N_5} \right)^2 \right\}$