**F. J. Gould and John W. Tolle**

A NECESSARY AND SUFFICIENT QUALIFICATION CONSTRAINED OPTIMIZATION

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The general nonlinear programming problem is considered:

$max\ f(x)$ with respect to

$g_i(x) = 0 \qquad i = 1, \ldots, m$

$M_i(x) = 0 \qquad i = 1, \ldots, k$

$x \in D \leqslant R^n$

The authors introduce the following notion: $(g, M, D)$ triplet. In the above problem it is denominated Lagrange's ordinate in point $x_0$, if for any objective function with a local maximum in $x_0$, there exist vectors $\psi \in R^k$ and $u \in R^m$ such as

$$\nabla f(x_0) > \sum_{i=1}^{k} \psi_i \nabla M_i(x_0) + \sum_{i=1}^{m} u_i \nabla g_i(x_0)$$

$u_i g_i(x_0) = 0 \qquad i = 1, \ldots, m$

$u_i \geqslant 0 \qquad i = 1, \ldots, m$

A necessary and sufficient condition is given for the Lagrange regularity.

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