

# Improved Frank-Wolfe method: application to the traffic assignment problem

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The Frank-Wolfe method [1] was first introduced in quadratic programming at once it proved very effective for the resolution of large scale flood problems, with particularly interesting assets, resting on the marvelous fusion of the mathematical programming and the graph theory, the Frank-Wolfe method, is famous for its advantages. Unfortunately, its convergence rate is not entirely satisfactory; this slowness is due mainly to the way in zigzag described by the points of the algorithm. To remedy of this disadvantage, much of attempts have been done, since the first "L. J. Leblanc" works [3] until recent works of "Ziyou Gao and Al" [5]. On our behalf, we will propose, in this paper a new modified version of the Frank-Wolfe method. this alternative consists to combine a descent direction modification, to knowing the Fukushima algorithm [2], with a widened line search technique[4]. We also present preliminary computational studies in a C++Builder5, in these we apply the Frank-Wolfe method and its modifications to some Traffic assignment problems. The numerical experiments carried, indicate a clear advantage of the new version, comparing to the other methods.

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