Title: The Time-varying Maximum Flow Path Problems Authors: D. Sha, Faculty of Mathematical and Science Shanghai Normal University <u>danielsha@hotmail.com</u>

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**Abstract:** We address a type of dynamic path problem in this paper. Let N=(V,A,b,c) denote a time-varying network, where V is the vertex set, A is the arc set, b(x,y,f(x,y)) is the transit time of arc (x,y) which depends upon the flow values f(x,t) to be sent from vertex x to y via arc (x,y) at time t, and c(x,y,t) is the capacity of arc (x,y) at time t. t takes value among  $\{0,1,\ldots,T\}$  where T>0 is a given positive integer. The problem is to find the path from the source vertex to the sink vertex which can be traveled in time limit T, such that the flow sent along this path is maximized. The problem is shown to be NP-complete and the relevant algorithms are proposed which can find the optimal solution in pseudopolynomial time.