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Efficient and verifiable outsourcing computation of large-scale nonlinear programming

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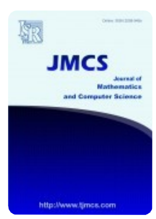

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Abstract

Nonlinear programming (NLP) problems arise in various fields, such as transport, financial engineering, logistics, urban planning, supply chain management, and power system control. Solving large-scale NLPs are usually so computationally expensive for resource-constrained users within a feasible time. The cost-effective solution is computation outsourcing, but this raises security concerns such as the input and output privacy of the customers, and cheating behaviors of the cloud since NLP problems always carry sensitive information. In this paper, we develop a practical secure and verifiable schema for solving outsourcing large-scale (NLP) with the GRG method. Also, we apply approximate KKT conditions for verifying the optimality of the result returned by the GRG algorithm. We implement the proposed schema on the customer side laptop and using AWS compute domain elastic compute cloud (EC2) for the cloud side.

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Keywords

Cloud computing | *secure computation outsourcing* | *verifiable computing* | *security and privacy nonlinear programming problems*

MSC

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