

# **HARNESSING THE CLOUD FOR SECURELY OUTSOURCING LARGE-SCALE SYSTEMS OF LINEAR EQUATIONS**

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# Abstract

Cloud Computing has a large potential computational power, at a reduced cost. It enables customers with the limited computational resources to outsource their large scale computations. Due to this, customers can economically enjoy faster computational power that can be obtained in a pay-per-use manner. Besides these benefits, security is the primary problem that prevents the wide usage of the cloud computing model when the customers' confidential data is consumed and produced during the computation.

To overcome the above problem, in this project a secure framework is provided, that protects the sensitive information and enables computations with encrypted data. And it also helps the customer with cheating detection mechanism, by enabling the verification of the computation results.

The framework provides a secure outsourcing mechanism for the customers. To solve the large-scale systems of Linear Equations in cloud, iterative method is used. This method is easier to implement when compared to direct method and it demands only simple matrix-vector operations. The iterative method enables the customer to securely harness the cloud by finding successive approximations to the Linear Equations while keeping both sensitive input and output secured.