Ain Shams University
Faculty of Engineering
Computer & Systems Engineering Department

Mobile Cloud Computing

Thesis

Submitted in partial fulfillment of the Requirements
For the M.Sc. Degree in Electrical Engineering
(Computer and Systems)

By

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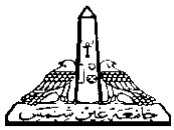

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STATEMENT

This thesis submitted as partial fulfillment of master degree in electrical engineering, Faculty of Engineering, Ain Shams University.
The author carried out the work included in this thesis, and no part of it has been submitted for a gegree or qualification at any other scientific entity.

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Thesis Summary

Mobile Cloud Computing is emerging as one of the most important branch of mobile computing. The quick increasing of mobile devices usage and explosive growing of the mobile applications are facing many challenges in their resources as low computing power, battery life, limited bandwidth and storage.

Mobile Cloud Computing (MCC) has been introduced to solve the mobile resources problem by moving the processing and the storage of data out from mobile devices to the cloud. MCC gives the availability to develop real time applications with high computational power and huge storage as face detection and recognition applications. Law enforcement agencies are using face recognition software as a crime-fighting tool.

The development of parallel computing is increasing both speed and accuracy of parallel algorithms such as facial detection algorithm. Graphics Processing Unit (GPU) is a massively parallel device which has the capability of processing large amounts of data required to perform the detection tasks very quickly. Speedups are obtained by exploiting the independent data calculations and executing them in parallel on the GPU. The GPU implementation improves the application speedup by 9times versus CPU.

However, security and privacy is one of major challenges that impeded MCC from being widely adopted. Constrains are originated from moving and storing sensitive data in the cloud. Chain Security Mechanism (CSM) is the proposed security system to provide a secured access control for data storing and processing in the cloud.

The aim of this work is providing a complete module for secured mobile cloud computing with face recognition real time application.

This thesis gives explanation of MCC definition, Builds private cloud with Open Source Cloud OS, develops face recognition as MCC application with presenting the face detection and faces recognition algorithms increases the processing speed by using the algorithm parallelization technique and GPU accelerated computing.

At the end, this thesis provides the security mechanism CSM by taking in consideration the different component of MCC.

The results demonstrate that the proposed architecture is promising for real-time mobile cloud computing application with speedup 40 times compared to mobile application and offering secured mobile cloud computing by minimize security management overhead and reducing the mobile cloud threats and attacks.

Key words:

Mobile Cloud Computing; Cloud Computing; Open Source Cloud OS; Openstack; Openshift; Client Server communication; Web Services; Image processing; face Detection ; face Recognition, cloud security, data encryption and decryption.

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