

**A**  
**PROJECT BASED LAB REPORT**  
**On**  
**PARALLEL MONTE CARLO METHODS**

**Submitted in partial fulfilment of the**  
**Requirements for the award of the Degree of**  
**Bachelor of Technology**  
**In**  
**Computer Science & Engineering**

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**K L University**

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**2014-2015**

# **K L University**

## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



### ***CERTIFICATE***

This is to certify that this project based lab report entitled “**PARALLEL MONTE CARLO METHODS**” is a bonafide work done by K.HiteshRam (12003344) A. Aditya(12003409) D. Pooja Krishna (12003003), P. Sai Kumar(12003399) in partial fulfilment of the requirement for the award of degree in **BACHELOR OF TECHNOLOGY** in **Computer Science and Engineering** during the academic year 2014-2015.

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**Lecturer In charge**

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**Head of the Department**

# K L University

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



### *DECLARATION*

We hereby declare that this project based lab report entitled “**PARALLEL MONTE CARLO METHODS**” has been prepared by us in partial fulfilment of the requirement for the award of degree “**BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING**” during the academic year 2014-2015.

we also declare that this project based lab report is of our own effort and it has not been submitted to any other university for the award of any degree.

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## **ABSTRACT**

Our Project entitled “Parallel Monte Carlo Methods” is based on Monte Carlo experiments which are a broad class of computational algorithms that rely on repeated random sampling to obtain numerical results they are often used in physical and mathematical problems and are most useful when it is difficult or impossible to obtain a closed-form expression, or infeasible to apply deterministic algorithm. Monte Carlo methods are mainly used in three distinct problem classes which are optimisation, numerical integration and generation of draws from a probability distribution.

As part of our project we Implemented applications of Monte Carlo methods with parallelization using OMP and MPI and PThread mechanisms, where we determined the temperature at a given point on a 2D plate, performed Integrations and implemented PRNG using GSL Libraries, Implemented Tree Search and Particle Transport is also performed using Monte Carlo Methods

