**Decomposition Based**

**Multi Objective Particle Swarm Optimization**

*Project report submitted*

*In fulfilment of the requirement for the degree of*

**Bachelor of Technology**

By

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**CERTIFICATE**

It is certified that the work contained in the project report titled “Decomposition Based Multi Objective Particle Swarm Optimization”, by Santosh Kumar (120103082) and Devang Agarwal (120103028) has been carried out under my supervision and that this work has not been submitted elsewhere for the award of a degree.

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**DECLARATION**

We declare that this written submission represents our ideas in our own words and where others’ ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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**APPROVAL SHEET**

This project report entitled “Decomposition Based Multi Objective Particle Swarm Optimization” by Santosh Kumar and Devang Agarwal is approved for the degree of Bachelor of Technology.

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**ABSTRACT**

Optimization is a tool to get the optimal solution to a problem which is best under some given constraints. Most of the real world problems are multi-objective in nature i.e. we optimize two or more conflicting objectives or functions simultaneously while satisfying constraints of the problem. This project was inspired from different shortcomings of existing methods to solve multi-objective optimization problems (MOPs). There exist many heuristic techniques to solve these MOPs, which are inspired from some natural process. One such method which was inspired from the synchronised motion of the bird flock or fish flock in search of the food is Particle Swarm Optimization technique (PSO). This method is relatively new in the field of multi-objective optimization. This method is still being explored by many researches to make it better in all aspects of an optimization technique. In the course of the project we developed a new Decomposition Based Multi Objective PSO algorithm to obtain good diversified pareto optimal solution for a multi-objective optimization problem.

Keywords: Diversity, Guide selection, Particle swarm optimization, Multi-objective Optimization

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