# Abstracts

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## High Dimensional Problem Optimization Using Distributed Multi-Agent PSO

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**Abstract:** Curse of dimensionality is a major difficulty with the classic optimization methods for high dimensional applications in which the problem size grows rapidly and mostly exponential with the number of space. In this work we present a simple yet effective multi-agent approach to apply distributed particle swarm optimization to meet such demand. Lip detection in color images, as a high-dimensional problem, has been investigated and a novel approach for obtaining an optimized lip-map was proposed. Experimental results show 92% correction rate which is 11% increase in comparison to the simple approach. A computational complexity analysis also shows the superiority of the proposed architecture to be used in other large scale application.

**Keywords:** High dimensionality, Multi-agent systems, PSO, Lip detection.

## Estimation of Human's Performance in Automobile Driving

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**Abstract:** The combination of increasing population,growing demand for mobility, and limited funds and real estate for building new roads places a strain on the current transportation infrastructure. It seems that the vehicle control scheme should be changed. In order to this, it is necessary to design a machine or intelligent system that can cooperate with human in automobile driving. The roll of the machine depends on the human's behaviour. If human drives correctly, the machine command should not be effective, but, if he couldn't drive carefully for any reason, the roll of the machine would be more effective. Therefore, at first it should define a function that express the human's behavior within automobile driving. The goal of this paper is introducing a method which can estimate the human's performance within automobile driving. These data determine the level of human and machine autonomy. Fuzzy logic is used for human's behaviour simulation and for vehicle modelling, the single track bicycle model is used.

**Keywords:** Fuzzy control, Shared control of human and machine, Genetic algorithm.