

## OPTIMIZATION OF STEEL FRAMES USING GENETIC ALGORITHM

PARIJATHA N

Assistant Professor, Department of Civil Engineering,  
GSSS Institute of Engineering & Technology for Women, Mysore, Karnataka, India

### ABSTRACT

One of the major purposes of optimization in civil engineering is to perform a suitable design for the structure. This goal has to fulfill technical criteria and contain the minimum economical costs. Building frames are of the most customary civil engineering structures. Genetic Algorithm which is one of the optimization methods inspired by nature, has overcome this problem. In order to solve such problems, genetic algorithm needs a multiple analyses of structures. Therefore, in this study attempts were made to introduce and embed new formulae into a newly developed program to handle new techniques for selection and mutation as genetic operations. This optimization technique can well substitute that of the deterministic one where a considerable factor of safety and therefore, a heavy structure as always is a must. For this purpose, one may take into account the behavior for load, yield stress, young modulus, etc, using parameters such as standard deviation and variance, through which safety remarks can be embedded into the design procedure by some mathematical relations, resulting to optimization technique.

**KEYWORDS:** Genetic Algorithm, Reproduction, Crossover, Mutation Objective Function Constraints Optimum Weight