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2.1 Allele Bounds

A set of additional bounds determines the general direction in the search space which can be dualized by defining the remaining constraints. One may find a profitable point. More

3 Experiments

3.1 Functions Used

In order to assess the performance of the algorithm in relation to standard one point crossover various optimization problems were used as represented by the following functions

The first three to be minimized are the standard suite of five functions originally constructed by De Jong and which were intended to represent continuous differentiable optimization problems in an isolated manner

The De Jong's F1 as a simple optimization function and is defined by

$$\sum_{i=1}^n x_i^2$$

for $-10 \leq x_i \leq 10$

The De Jong's F2 is a noisy random Gaussian noise is added to its value every time it is evaluated and is defined by

$$\sum_{i=1}^n ix_i^{i-1} + \text{Gauss}$$

for $-10 \leq x_i \leq 10$

The De Jong's F3 as a global minimum of ... although there are any subo

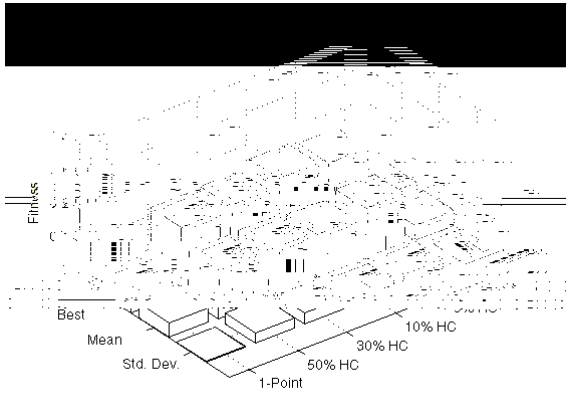
For a suitable unit peak problem the following constrained function was defined by Keane

$$\frac{\left| \sum_{i=1}^n \cos^{-1} x_i - \prod_{i=1}^n \cos x_i \right|}{\sqrt{\sum_{i=1}^n i x_i}} \quad \text{for } 0 < x_i < \frac{\pi}{2} \quad i = 1, \dots, n$$

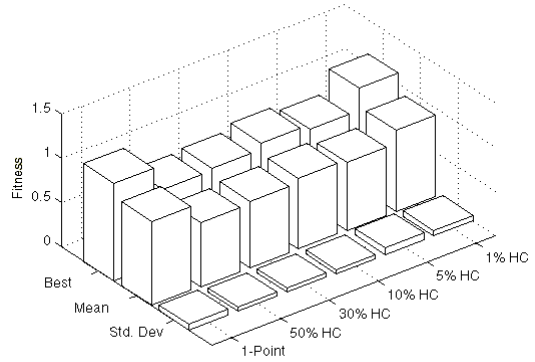
for $0 < x_i < \frac{\pi}{2} \quad i = 1, \dots, n$

subject to $\prod_{i=1}^n x_i > 0$

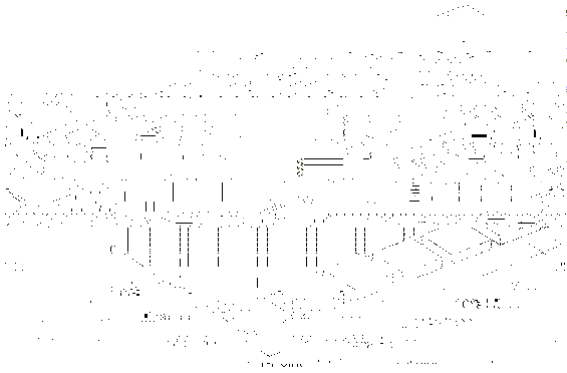
and $\sum_{i=1}^n x_i = 1$



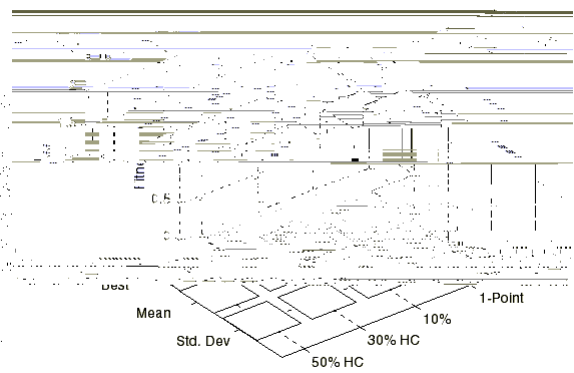
a F_{\rightarrow}



b F

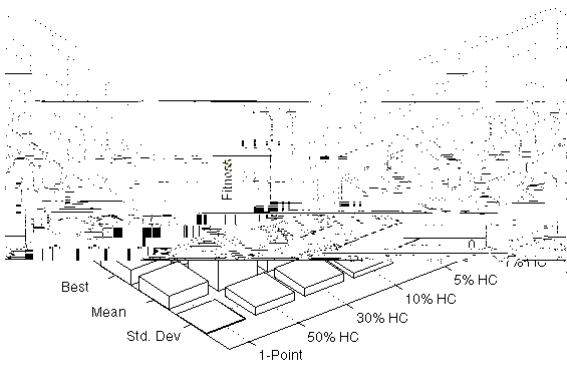


c F_{\rightarrow}

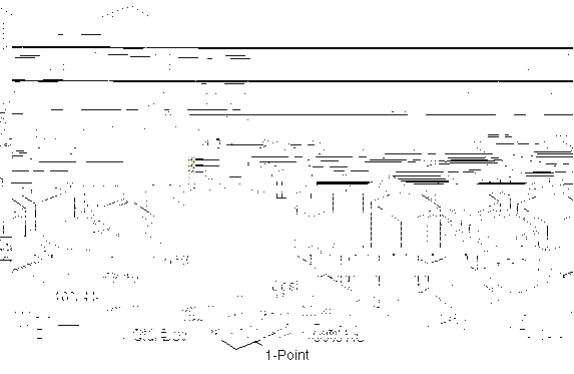


d F

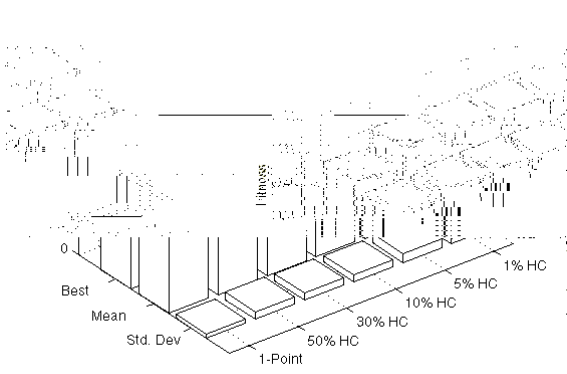
Figure results for runs using utation method



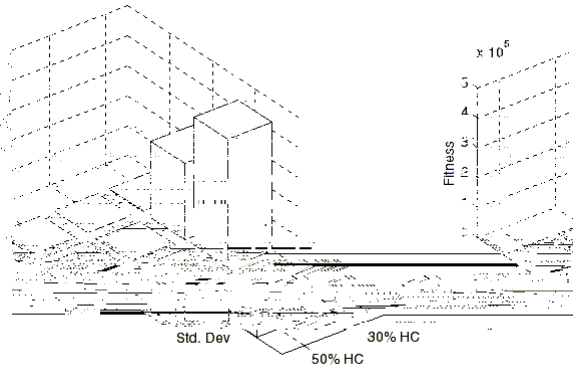
a F_{\rightarrow}



b F

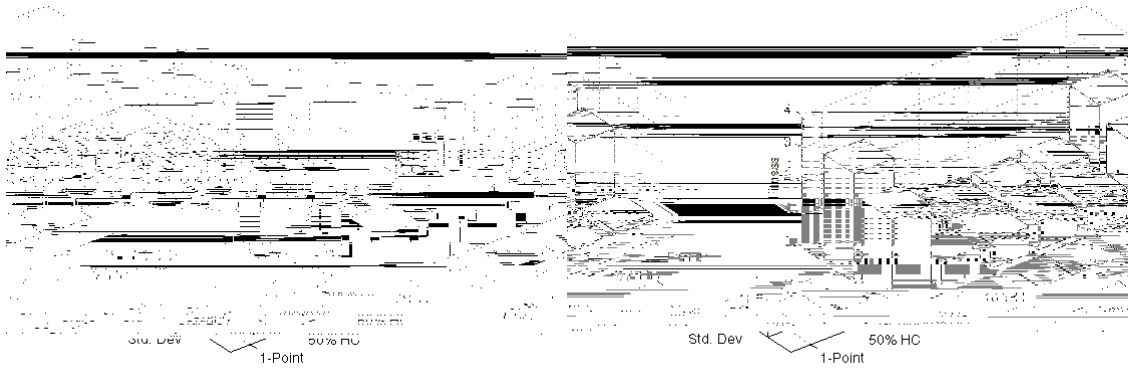


c F_{\rightarrow}



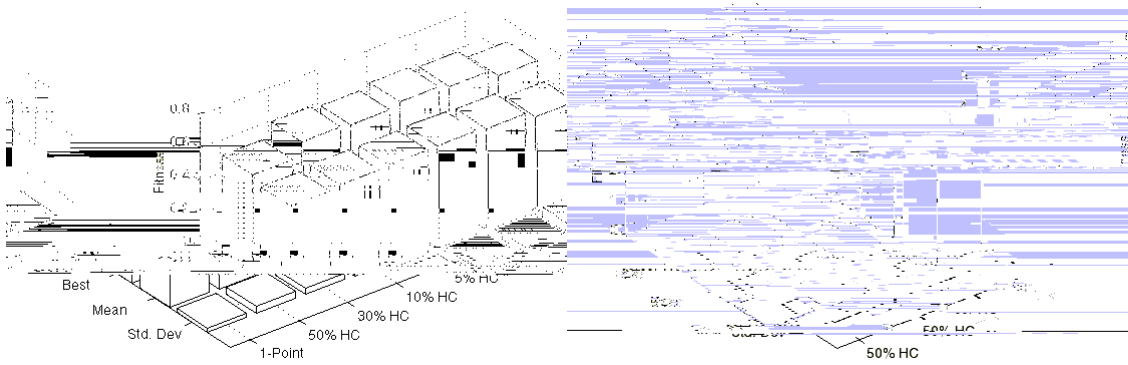
d F

Figure results for runs using utation method



a F₁

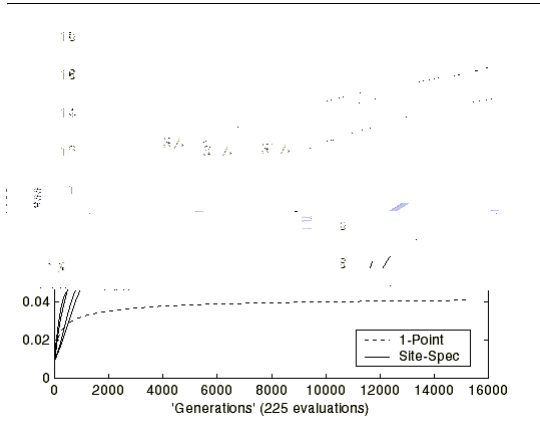
b F



c F₂

d F

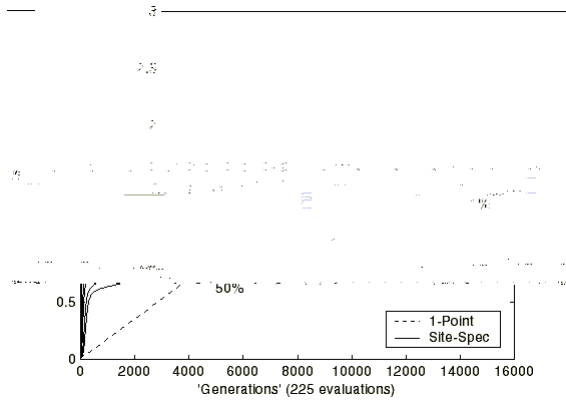
Figure results for runs with uniform mutation rate



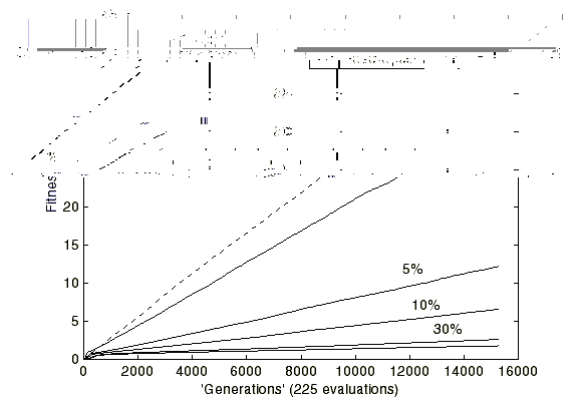
a F_1



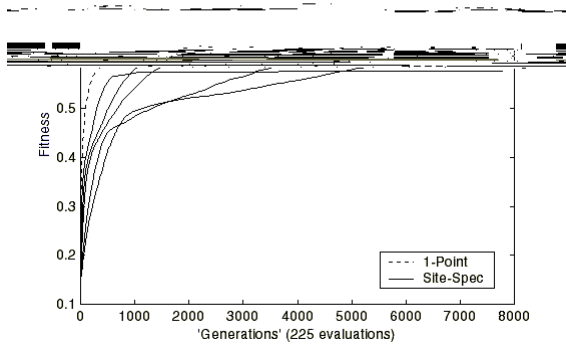
a F_1



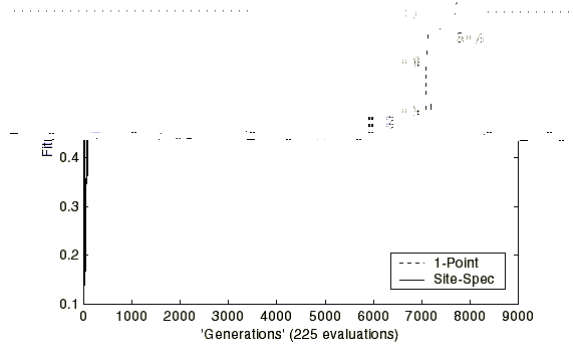
b F_2



b F_3



c F_4



c F_5

Figure 4: Average performance of ordinary runs

Figure 5: Average performance of runs with local search

5 Discussion

On examination the results particularly those gathered for functions F_1 and F_2 (even though opposite characteristics) encourage us to return to the classic and standard Equations (1) and (2)

significantly. Nevertheless, there would appear to be distinct optimum levels of β for the different functions. Figure 1 illustrates that a further reduction in the amount of β is not necessarily

that constructive crossover operations are still being carried out even at the very end of a run perhaps indicates a slowing of convergence despite the acceleration of improvement and that intuitively the nature of the

M. McClure, A. P. Husbands and J. Ives. A Comparison of Optimization Techniques for Integrated Manufacturing Planning and Scheduling. In H. M. Voigt, E. Eiben, I. Eickelberg and H. P. Schwefel, editors, *PPSN IV*. Springer, 2002.

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