6)

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1. Number of children generated | 1. Number of children for which expensive function evaluation is done | 1. Whether a response surface is used |
| (32,200)-ES | 200 | 200 | No |
| (91,32,200)-ES-SLHD | 200 | 200 | No |
| (91,32,200,80)-ESQR | 200 | 80 | Yes |
| (91,32,200,80)-ESRBF | 200 | 80 | Yes |
| (91,32,80)-ES-SLHD | 80 | 80 | No |
| (32,80)-ES | 80 | 80 | No |

Yes it is computationally advantageous to use surrogate response surfaces coupled to a heuristic.

Out of the 6 algorithms, only 2 of them (ESQR and ESRBF) use surrogate response surfaces. We note that those 2 algorithms do better than the other algorithms pretty consistently (after 100 evaluations). Although, the other algorithms catch up in performance to ESQR at 1000 evaluations, they are not even close to catching up to ESRBF.

ES, in particular, does the worst after 1000 evaluations. This suggests that SLHD does help. In other words, part of ESQR and ESRBF’s success is from the surrogate response surfaces, and part of their success is from the SLHD.

However, we also note that this is only one specific problem with some specific parameters. We cannot conclusively say that surrogate response surfaces are helpful, but it certainly suggests it!