Universiteit Leiden
The Netherlands

Evolution strategies for robust optimization

Kruisselbrink, J.W.

Citation
Kruisselbrink, J. W. (2012, May 10). *Evolution strategies for robust optimization*. Retrieved from https://hdl.handle.net/1887/18931

Version:	Corrected Publisher's Version
License:	Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden
Downloaded from:	https://hdl.handle.net/1887/18931

Note: To cite this publication please use the final published version (if applicable).

Cover Page

Universiteit Leiden

Leiden University Repository

The handle http://hdl.handle.net/1887/18931 holds various files of this Leiden University dissertation.

Author: Kruisselbrink, Johannes Willem
Title: Evolution strategies for robust optimization
Date: 2012-05-10

Propositions (Stellingen)

by Johannes Willem Kruisselbrink, author of

Evolution Strategies for Robust Optimization

1. Robust optimization is the practice of optimization given uncertainties in the system or model that is considered for optimization. It does not include uncertainties in the preferences. [This thesis]
2. Robust optimization always requires an explicit measure of the robust quality of candidate solutions. [This thesis]
3. For the $(\mu/\mu_I, \lambda)$-ES on the noisy sphere, the sample size of resampling techniques must grow quartically with linearly decreasing distance to the optimum to keep positive or optimal progress. To achieve linear convergence over the number of generations, the sample size must grow exponentially. [This thesis]
4. Evolution Strategies that use adaptive resampling techniques do not offer an improvement when comparing these to optimally tuned non-adaptive noise handling methods for expected fitness optimization of objective functions with stationary Gaussian additive noise. [This thesis]
5. The problem of finding robust optima comprises two different problem classes: emergent robust optima and shifted robust optima. Both require different optimization strategies. [This thesis]
6. High precision approximation of robust optima is, for certain scenarios, possible by avoiding redundant sampling in the overlapping uncertainty regions when comparing solutions. [This thesis]
7. The aim to find a local optimum is not the same as the aim to find high-quality solutions. For optimization, using the aim to find a locally optimal solution as a mere goal of optimization can be deceptive.
8. Finding one optimal solution to an optimization problem is often not enough. Searching for multiple different solutions is the next step for automated optimization.
9. The ultimate stress test for a simulation tool is using it in an evolutionary optimization loop. Evolution will try settings that a human never considers.
10. It is often more difficult to state an optimization problem than to solve it.
11. It is often more difficult to understand a solution to an optimization problem than to find it.