# A simple embedding method for the evaluation of fitness in a noisy environment

Juste Raimbault[1,2]
[1] UPS CNRS 3611 ISC-PIF
[2] UMR CNRS 8504 Géographie-cités

## 1 Context

Fitness with additive noise :

$$\vec{f}(\vec{x}) = \vec{f_d}(\vec{x}) + b(\vec{x})$$

Fitness with multiplicative noise : equivalent to additive noise if $\vec{f} > 0$

## 2 Proposed method

Embedding approach taking $n_{evals}$ as a supplementary objective in the optimization.
$\rightarrow$ take in practice $\frac{1}{n_{evals}}$ in the case of a minimization.

**Idea**

- Adaptive in sigma ? size of the confidence interval proportional to $\sigma/\sqrt{n}$
- Use bootstrap to get local confidence intervals ?