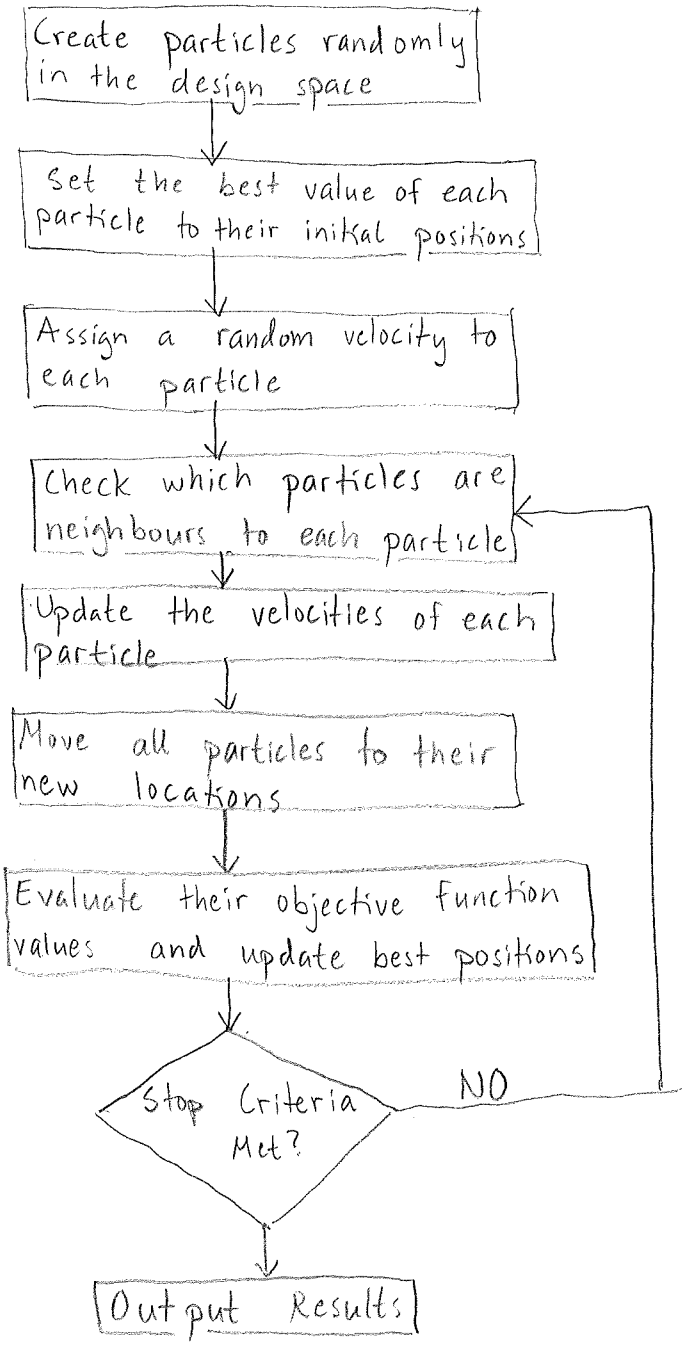
Particle Swarm Optimization

* Mimics animals that lives in swarms/packs
* The algorithm consists of a swarm with a number of individuals that is constant during the optimization

Algorithm Outline:



$$\bar{x}_{new} = \bar{x}_{old} + \bar{v}$$

The velocity function:

$$\bar{v} = \lambda_1 \bar{v} + \lambda_2 u_1 \cdot (\bar{p} - \bar{x}) + \lambda_3 u_2 (\bar{g} - \bar{x})$$

- $\bar{v}$: new velocity
- $\bar{v}$: old velocity
- $\lambda_1, \lambda_2, \lambda_3$: constants
- u_1, u_2: random numbers [0,1]
- $\bar{p}$: best position for this particle
- $\bar{g}$: best position of neighboring particles

$\bar{v}$ = old velocity + move towards best in history + move towards best in neighborhood

Example: