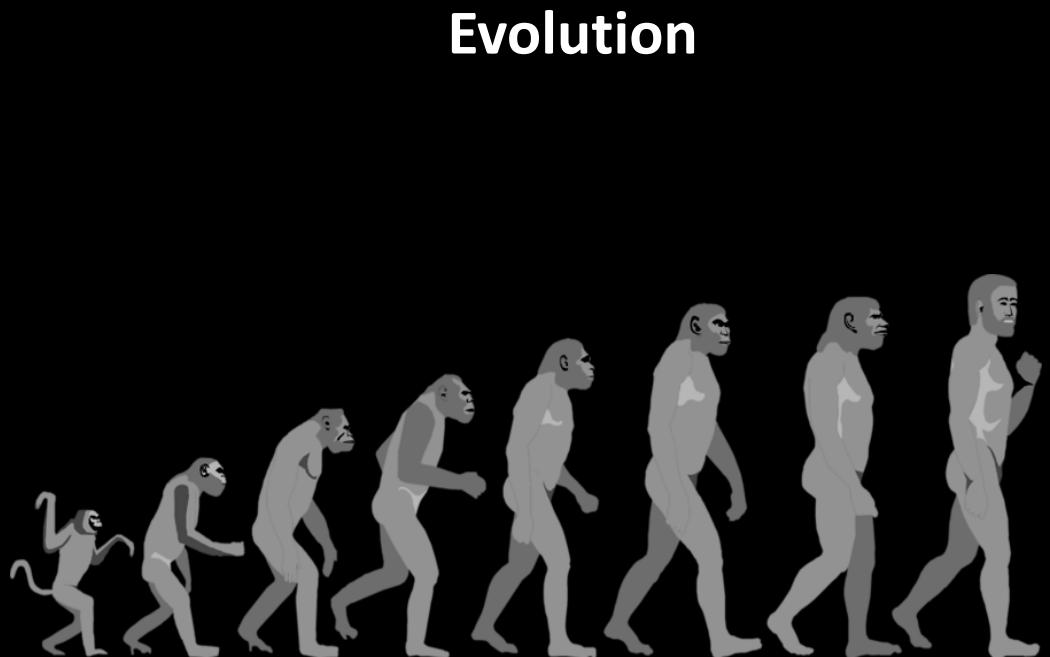


Completely Derandomized Self-Adaption in Evolution Strategies

What are Evolution Strategies?



[III. 1: url](#)

->

Evolution Strategies



[III. 2: url](#)

[III.3: url](#)

Case: Complex Problems Settings

Worldwide ecosystem



[III. 4: url](#)

e. g. cybercrime systems



[III. 5: url](#)

Case: Complex Problems Settings

Worldwide ecosystem



[III. 4: url](#)

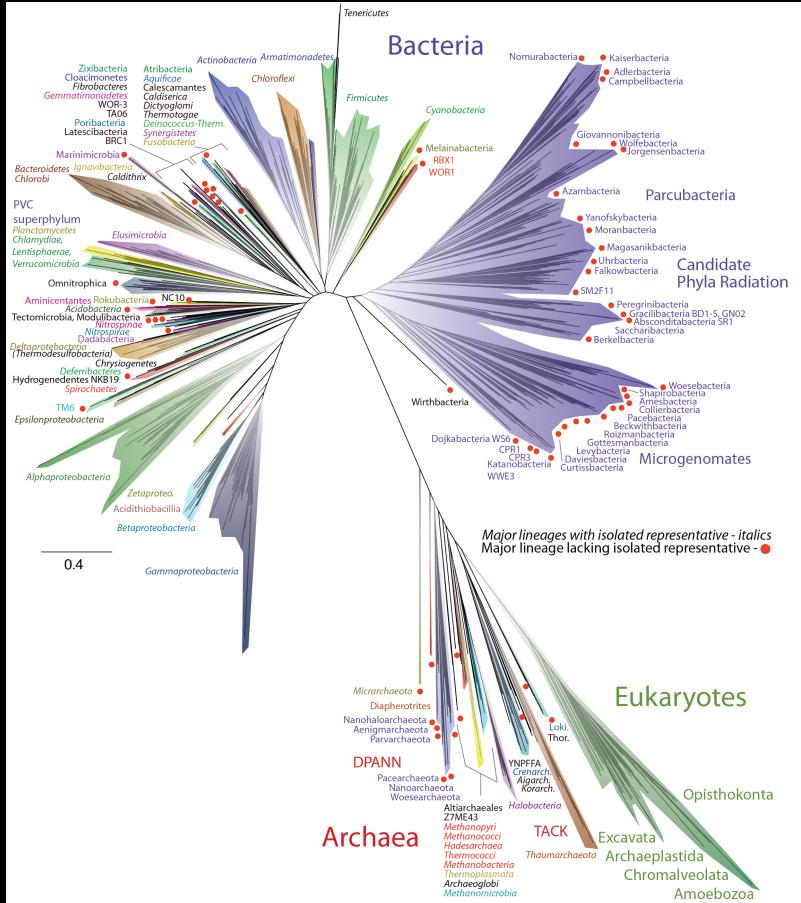
e. g. Worldwide flight connections



[III. 6: url](#)

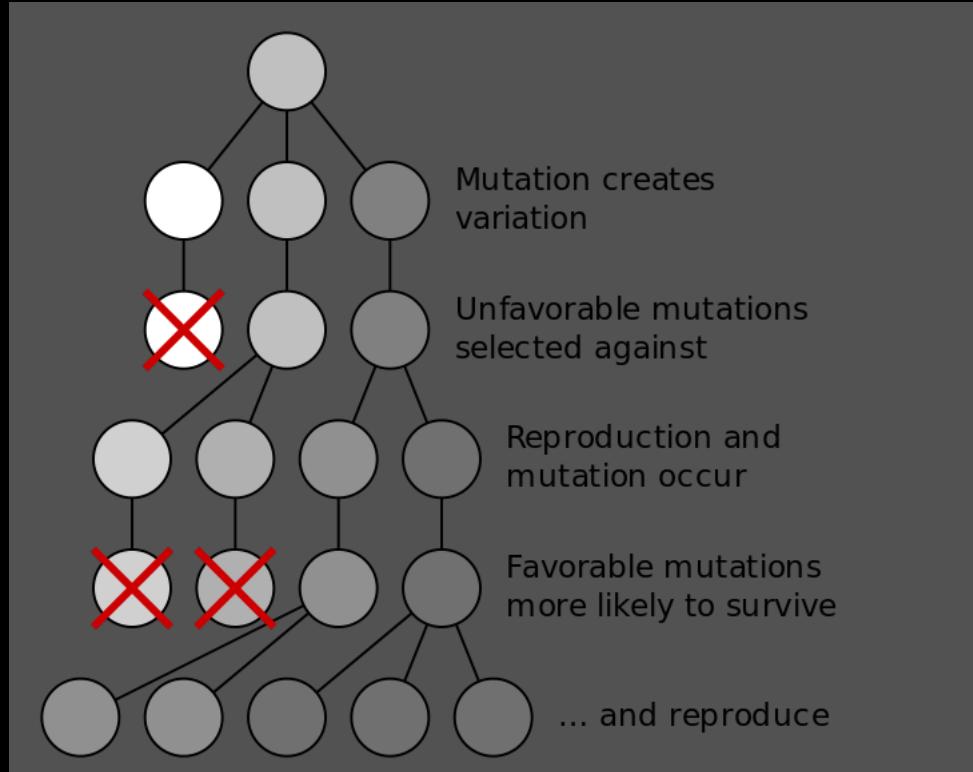
Searching for solutions

Evolution



III. 7: Treeoflife.jpg

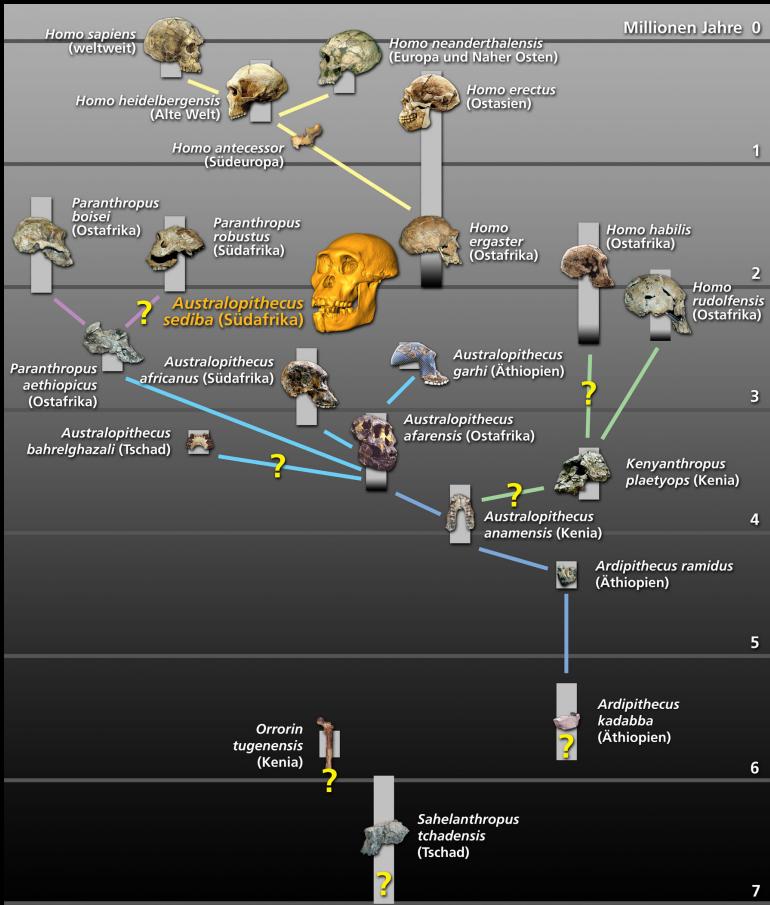
Evolution Strategies



III. 8: url

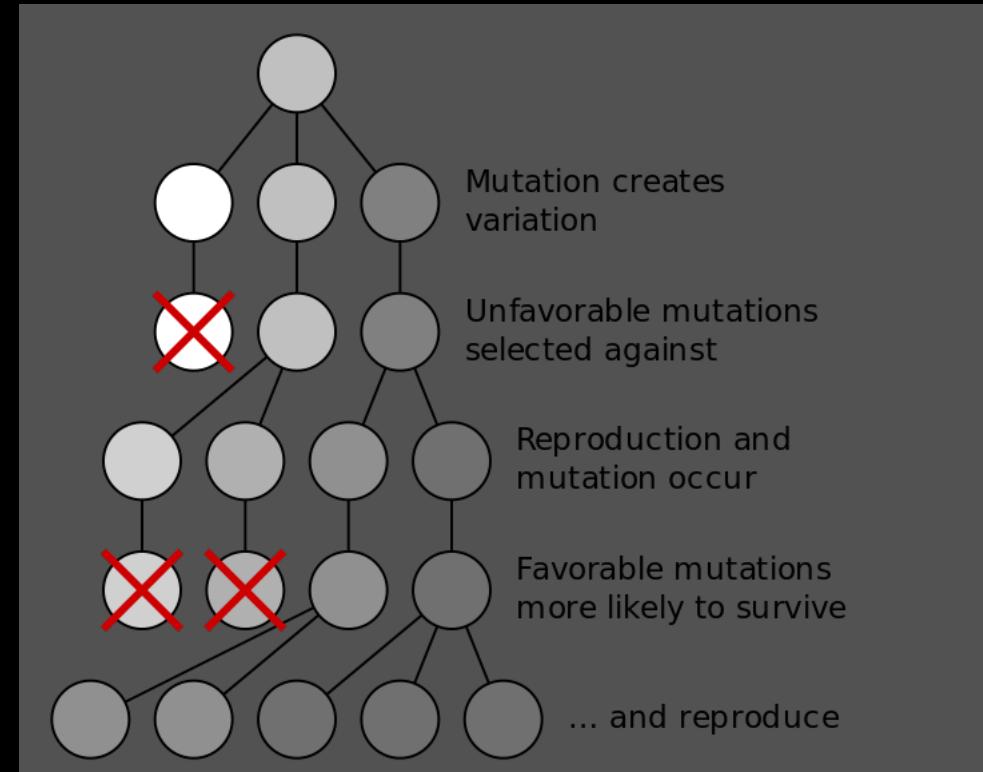
Searching for solutions

Evolution



[III. 9: url](#)

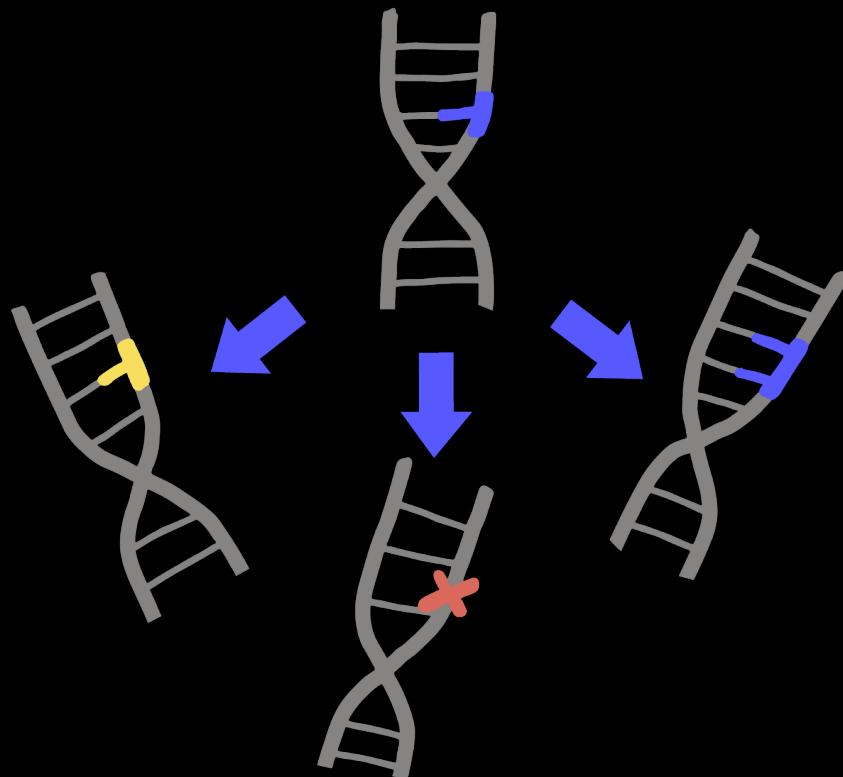
Evolution Strategies



[III.8: url](#)

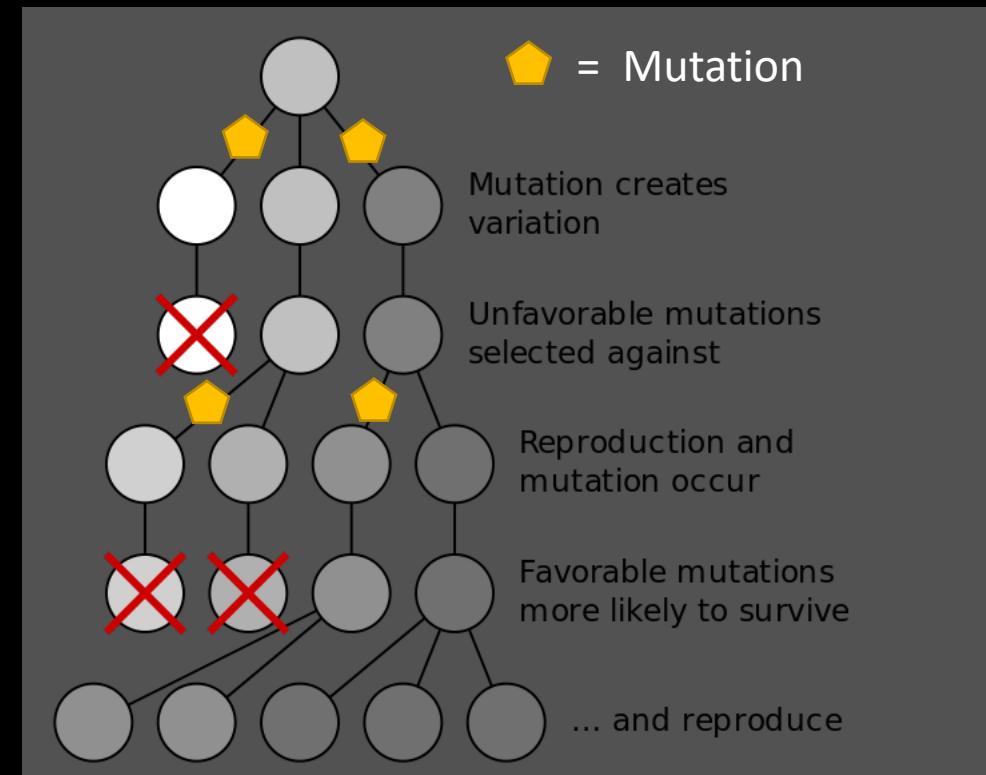
Searching for solutions

Evolution



[III. 10: url](#)

Evolution Strategies



[III. 8: url](#)

Whats the end result?

Earth:



[III. 11: url](#)

Evolution Strategies:

- Not the best but a good solution

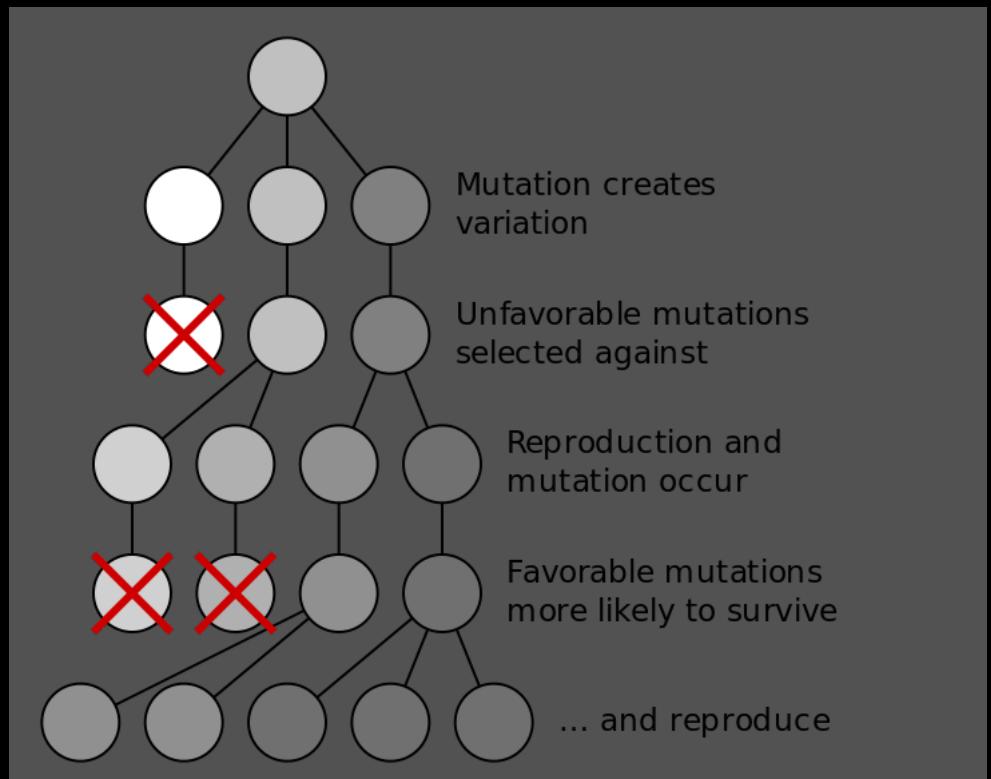


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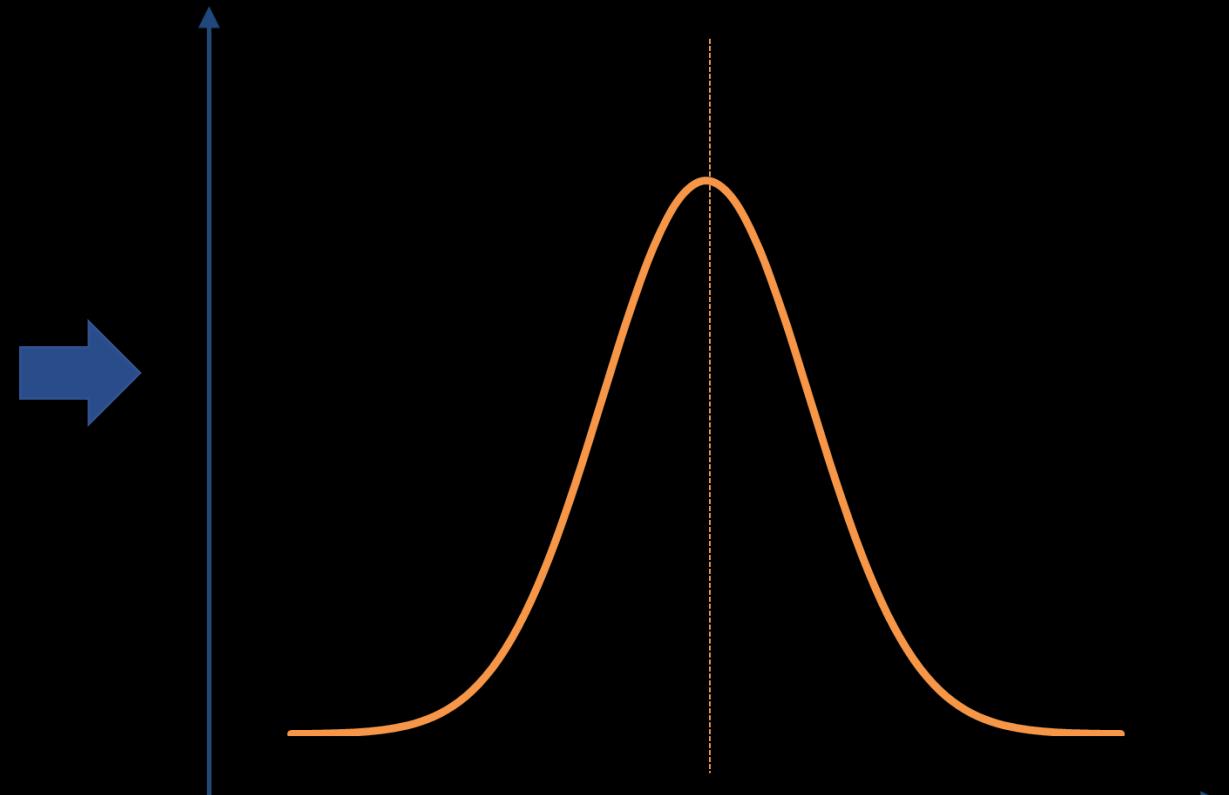
CMA-ES

Covariance Matrix Adaptation Evolution Strategy

What do we combine?

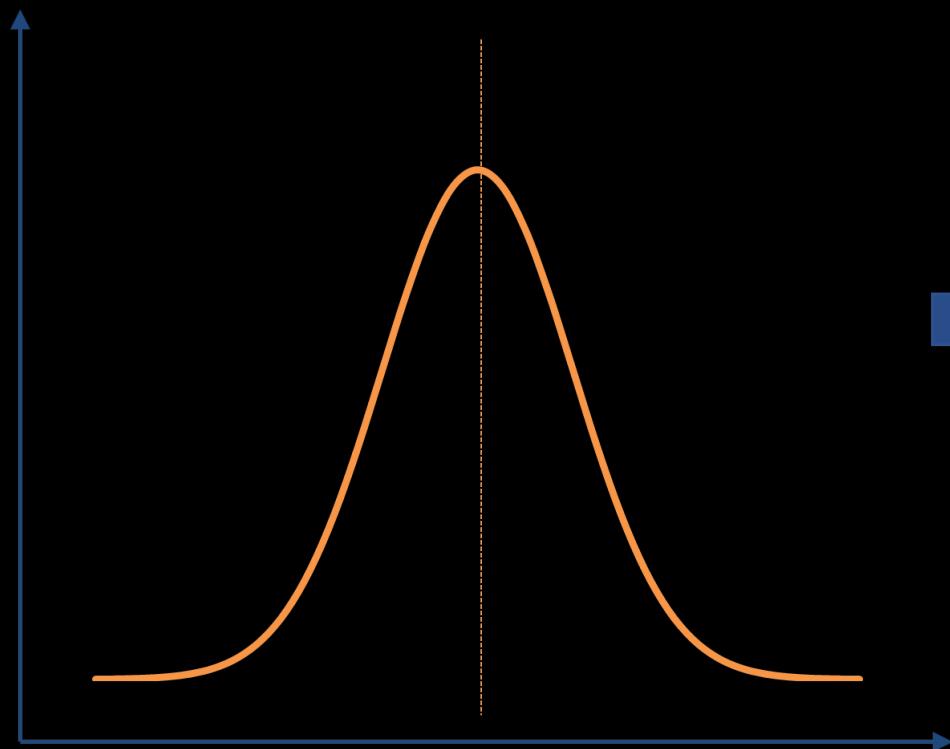


[III. 8: url](#)



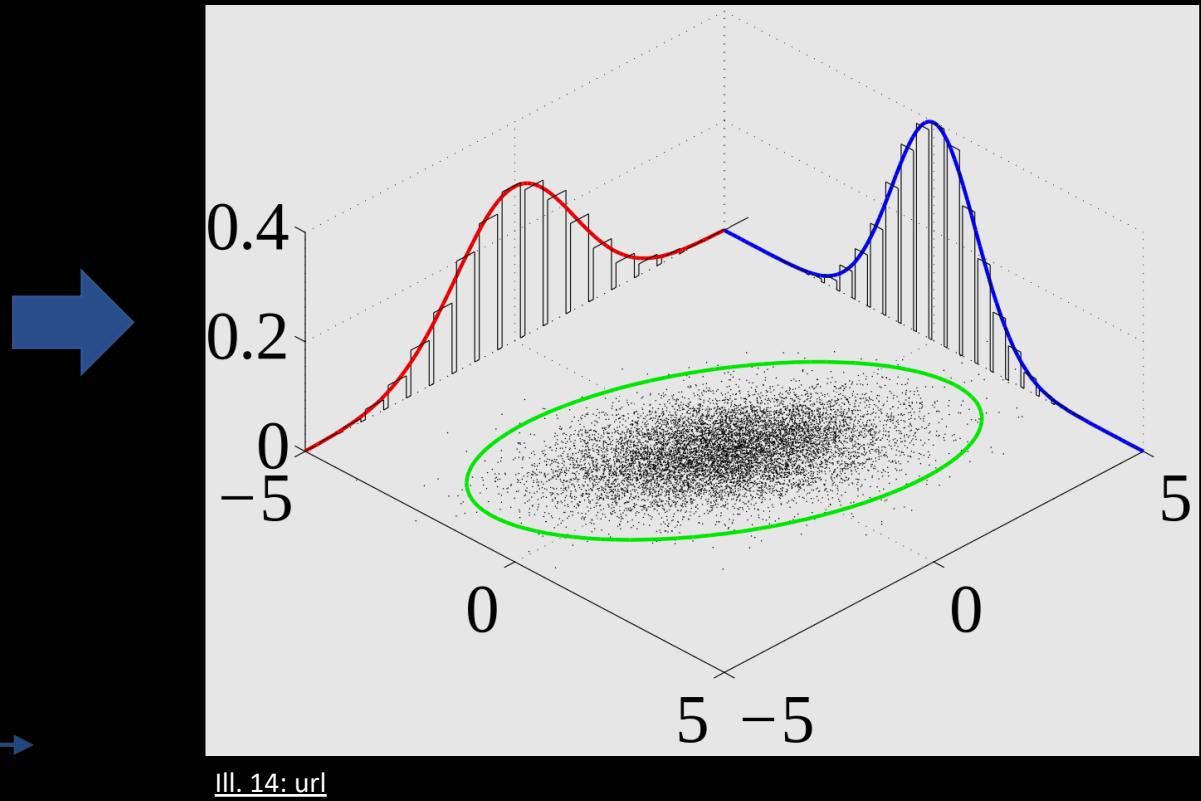
[III. 13: url](#)

Normal Distribution



Ill. 13: url

Joint probability distribution

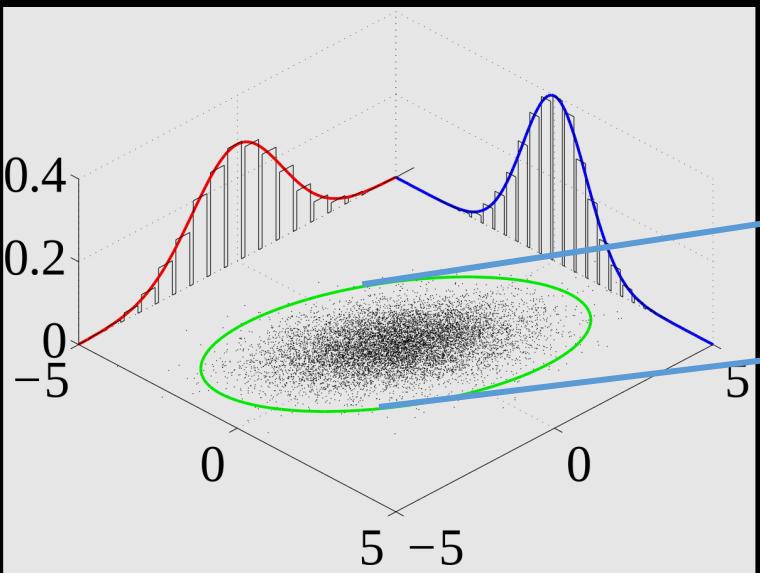


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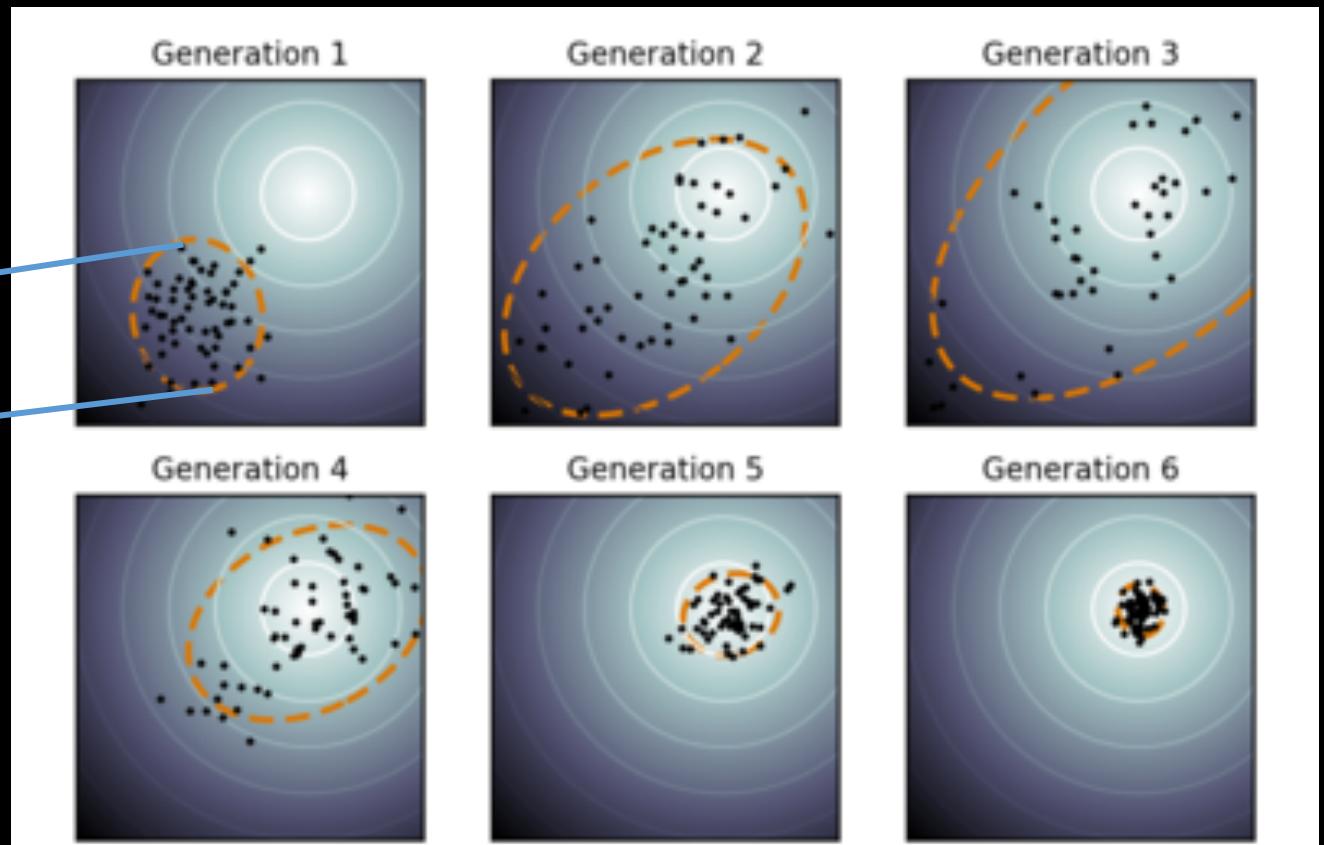
CMA-ES

- > increasing the probability of previously successful steps

Core Principle of CMA-ES

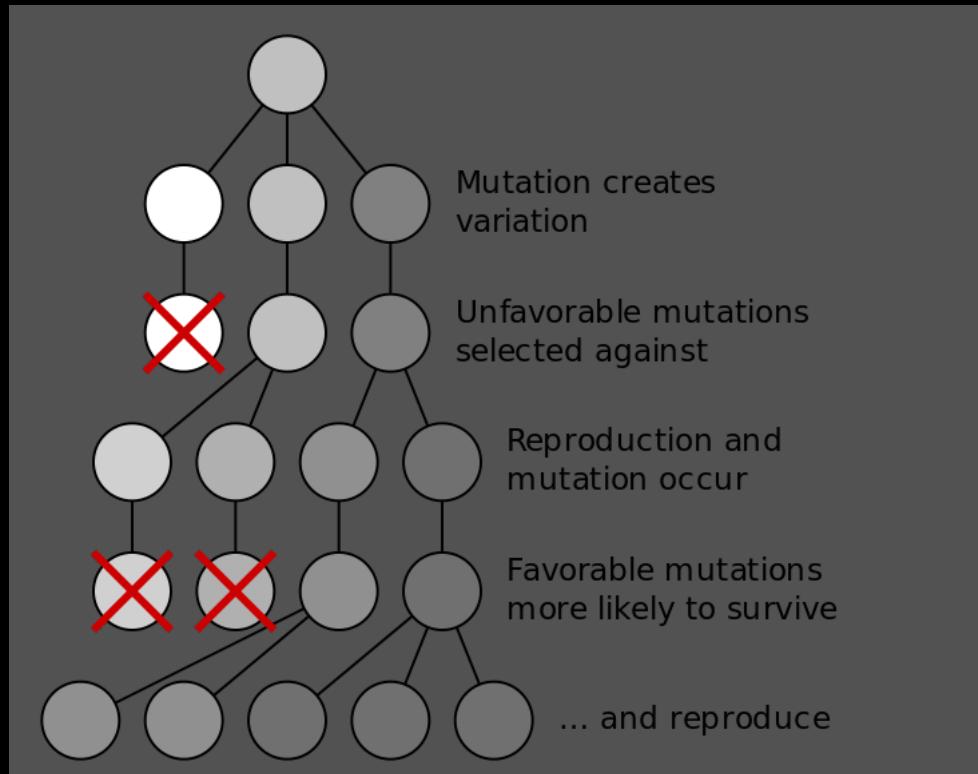


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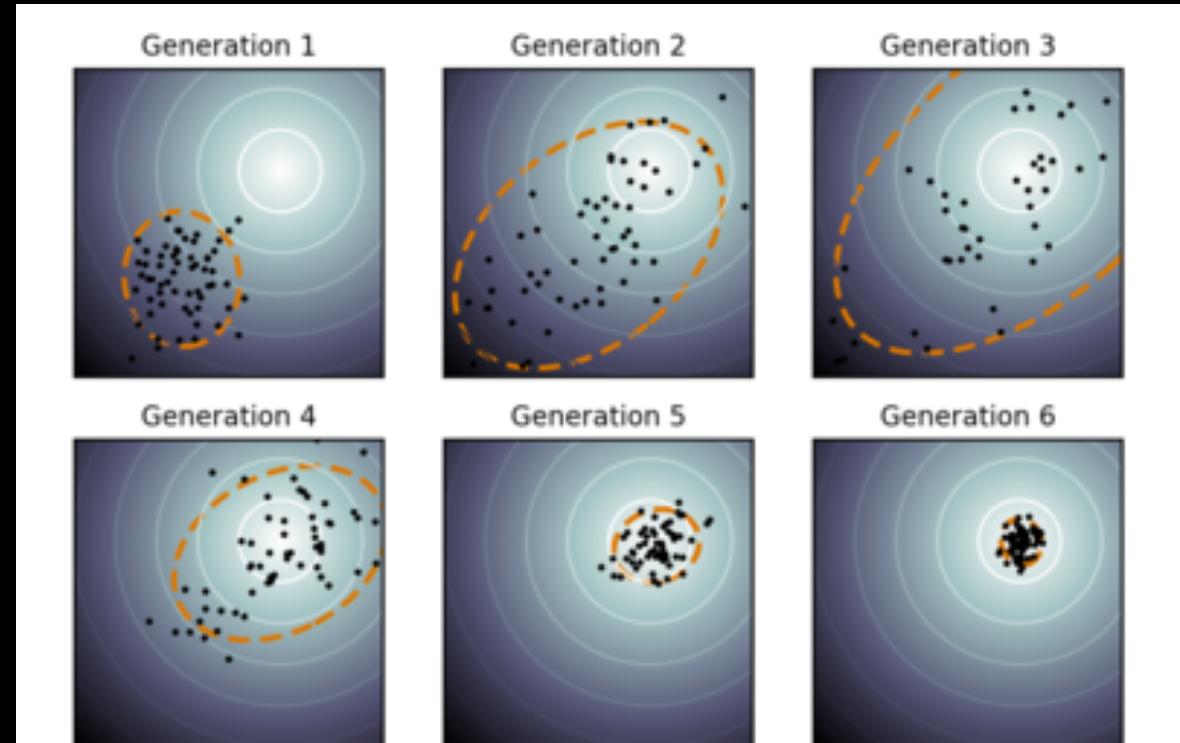


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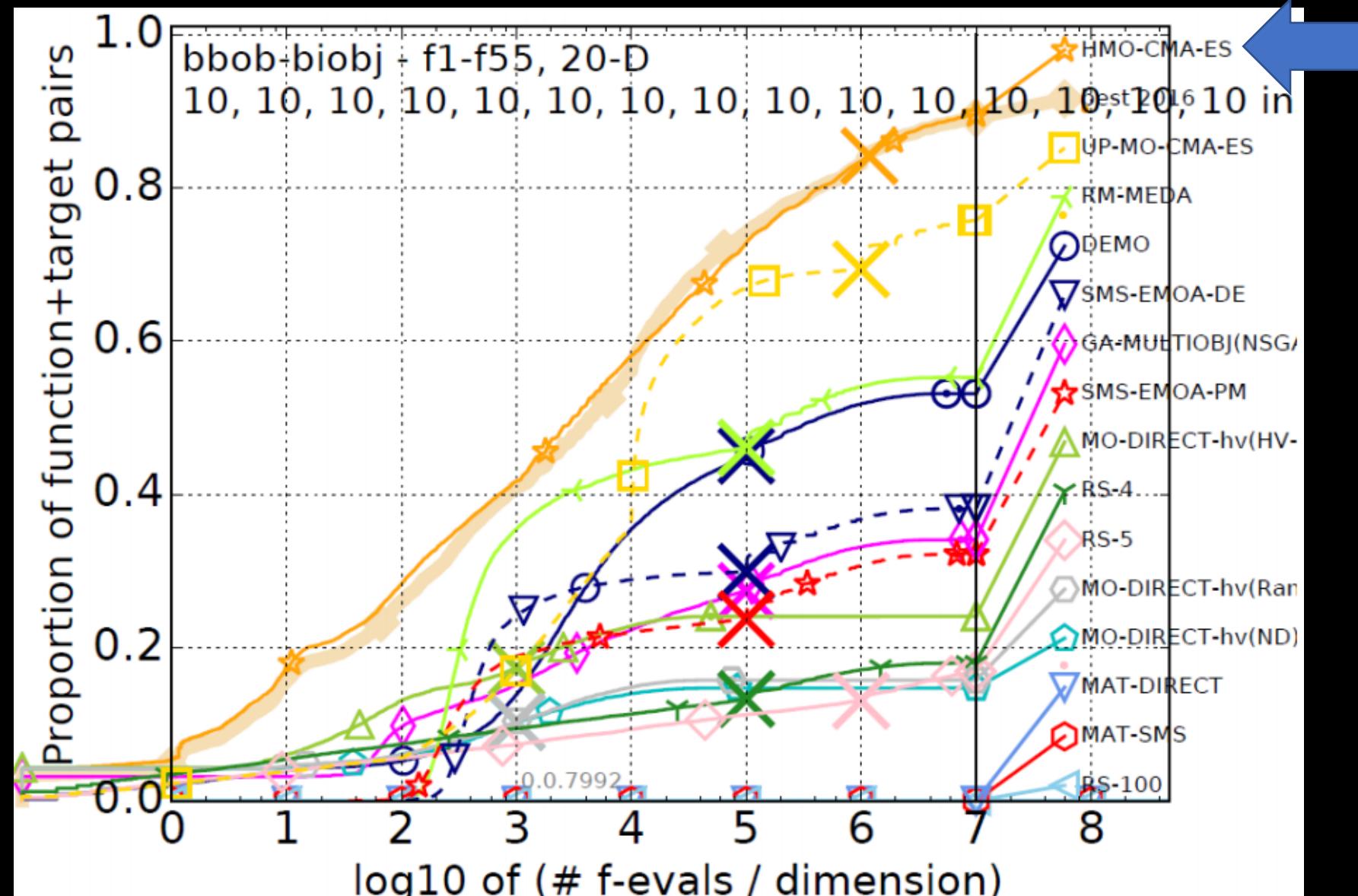
Core Principle of CMA-ES



[III. 8: url](#)



[III. 15: url](#)



III. 16: url

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