

# On stochastic evolving algorithms

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## Introduction

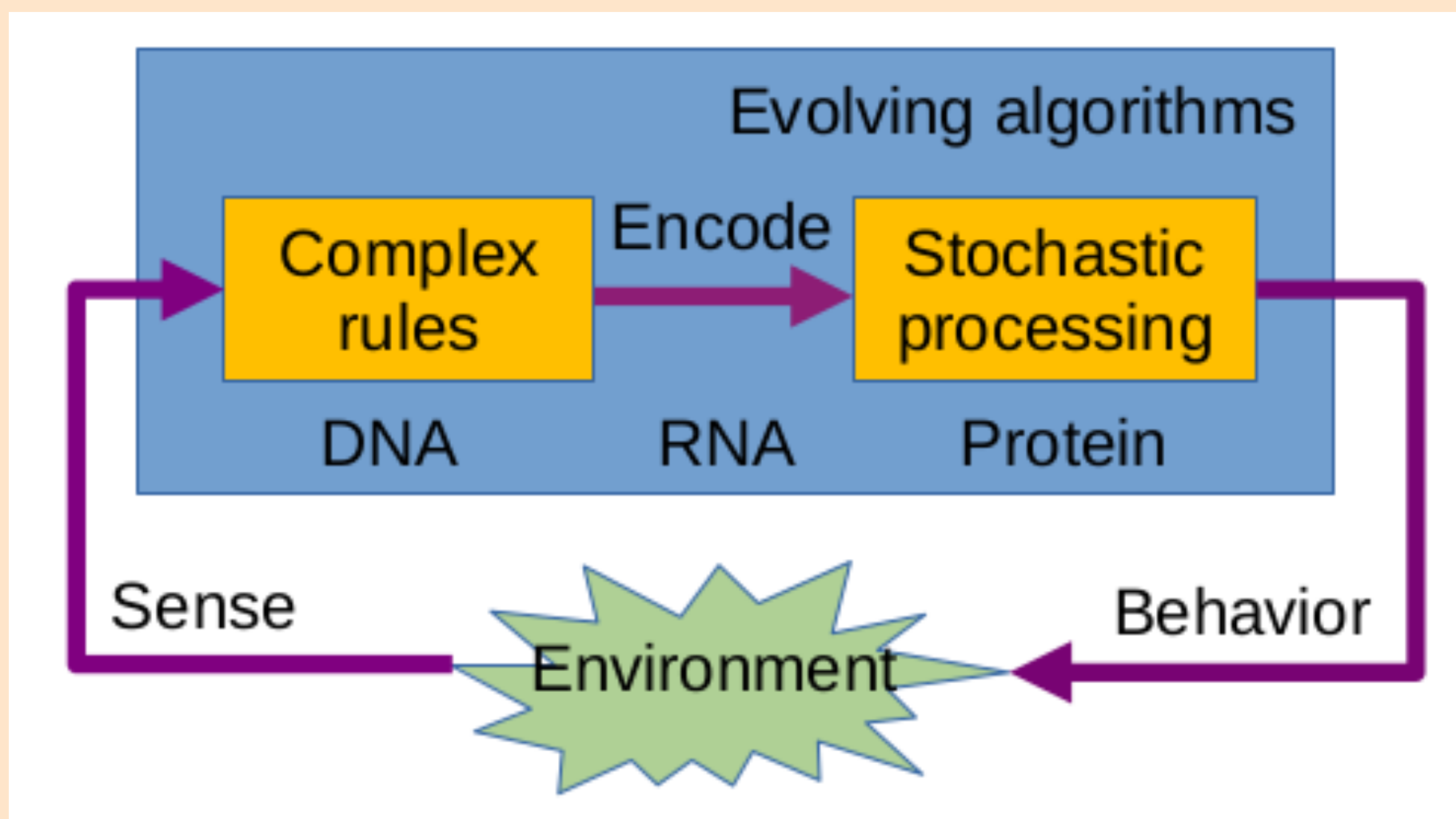
- Each algorithm running on a digital computer is rigid because it does not allow evolvability.
- Numerous adaptation schemes exist, but they do not manipulate source code during the adaptation phase.
- Nowadays, some programming languages offer an innovative approach to repairing the program code while running the code itself.
- We propose stochastic evolving algorithms consisting of complex rules and stochastic processing that allow self-improving.
- The present study aims to outline an architecture of the evolving stochastic algorithms based on the extended model of the mind.

## Research question

- How to develop algorithms capable of self-improving?

## Proposed method

Evolving algorithm=Complex rules+Stochastic processing

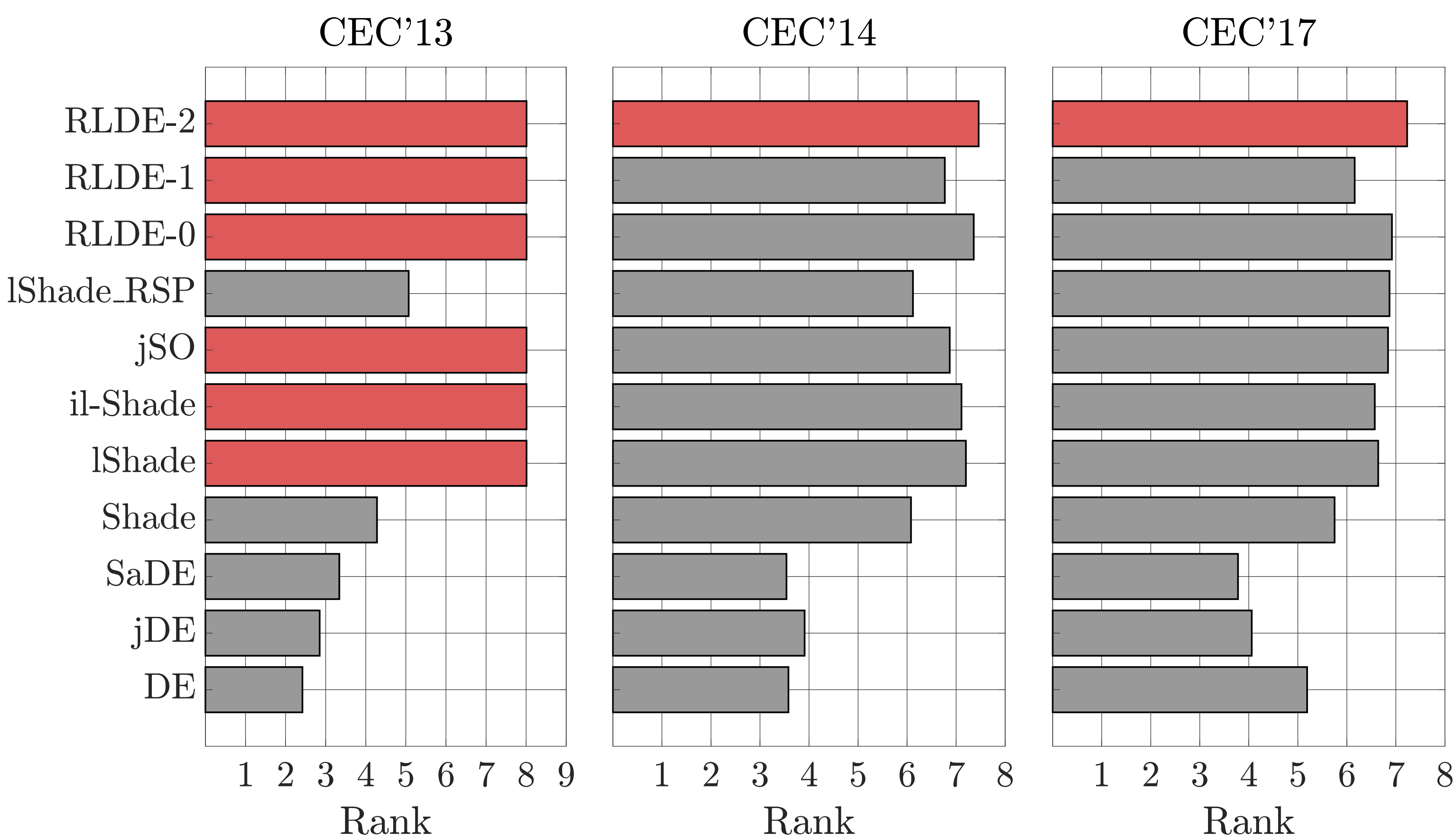


## Experiments

- Hypothesis: "The evolving algorithm for global optimization is able to achieve the best results by solving all three benchmarks issued for CEC Special Session/Competition on Real-Parameter Optimization during the last decade."

Test benchmarks	Type	CEC'13	CEC'14	CEC'17
	Unimodal	5	3	3
	Multi-modal	15	13	7
	Composition	8	8	10
	Hybrid	n/a	6	10
	<i>N</i>	28	39	30

## Results



## Conclusions and Future Work

- The aim of this preliminary study was to introduce the concept of evolving algorithms that could be capable of self-improving.
- The concept is founded on an extended model of the human mind taken from cognitive psychology.
- The results of the proposed RLDE variants were promising when compared with the results of the other eight DE algorithms.
- Future research should cover widening the developed approach to the other problem areas, e.g., industrial optimization.