

Automating Algorithm Design through Genetic Programming Hyper-Heuristics

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What does the title mean?

- Reducing the human component in algorithm design



<https://scratch.mit.edu/discuss/m/topic/200574/>

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- Reducing the human component in algorithm design
- More work at the beginning, more possibilities
- Genetic programming hyper-heuristics as a method to the madness



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- 1 Background
- 2 Hyper-heuristics
- 3 Genetic Programming Variants
- 4 Autoconstruction
- 5 Summary

Outline

1

Background

- Evolutionary Computation
- Genetic Programming

2

Hyper-heuristics

3

Genetic Programming Variants

4

Autoconstruction

5

Summary

Outline

- 1 Background
- 2 **Hyper-heuristics**
 - What they are
 - What they aren't
 - How they work
- 3 Genetic Programming Variants
- 4 Autoconstruction
- 5 Summary

Outline

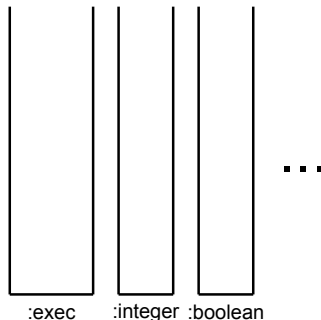
- 1 Background
- 2 Hyper-heuristics
- 3 Genetic Programming Variants**
 - Why they matter
 - Stack-based genetic programming
- 4 Autoconstruction
- 5 Summary

Stack-based genetic programming

Data-stacks are used for managing input and output of operations.

Programs are represented as linear sequences of literals and instructions. Below is an example of a simple Push program:

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(1 2 integer_equal)
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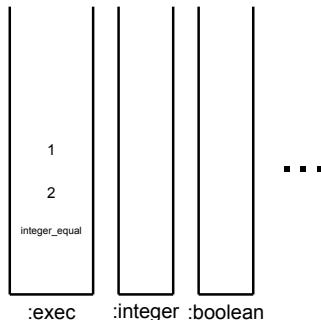


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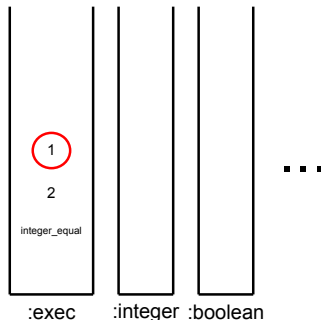


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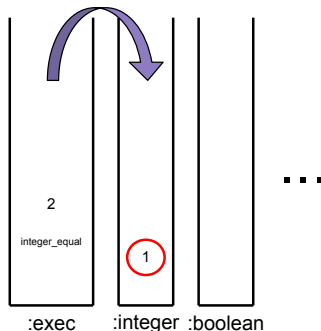


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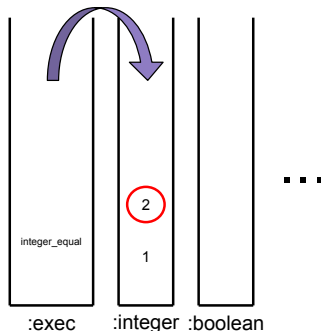


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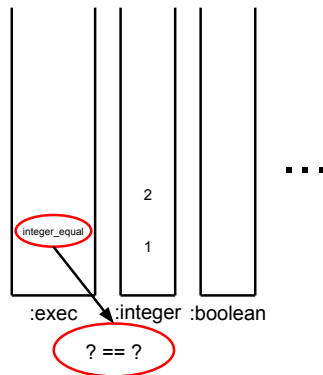


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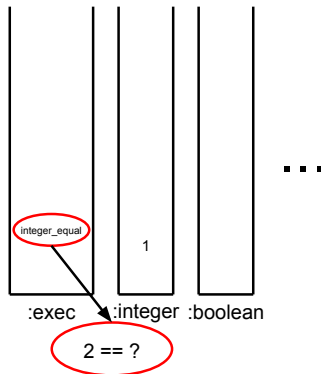


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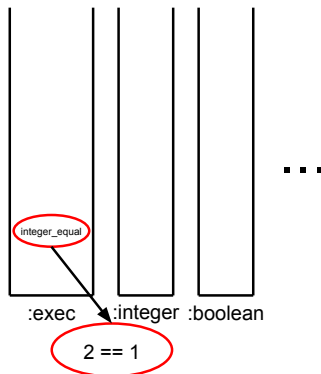


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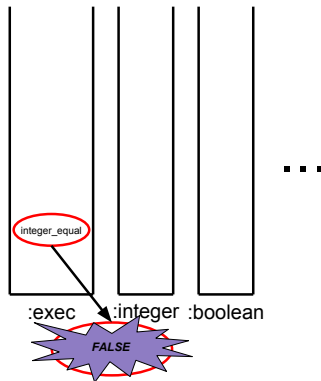


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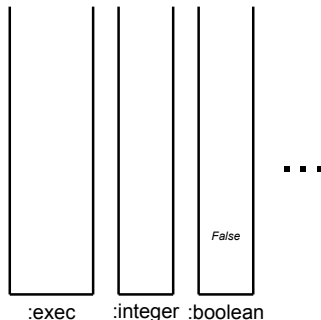


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 - What is it?
 - AutoDoG
 - Evolution is evolving!
 - Results
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