

An Enticing Environment for Programming

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Algorithmic Adventures

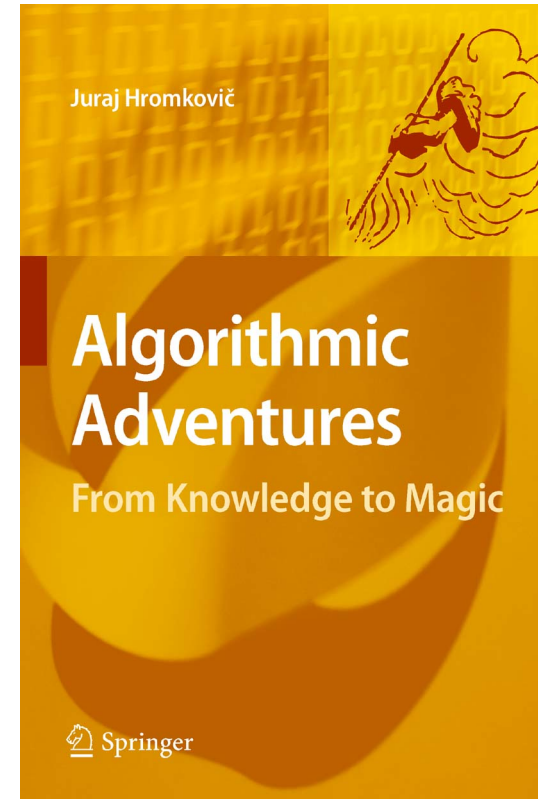
- Honors Class
- motivated non-CS students
- wonderful book:

Algorithmic Adventures

by Juraj Hromkovič

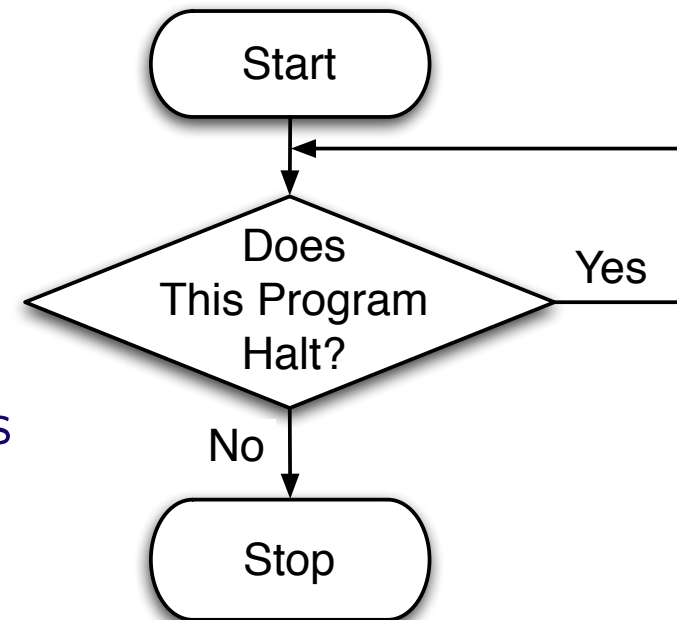
Springer Verlag, 2009

www.springerlink.com



Topics

- History of Computer Science, Algorithmics
- Infinity, Limits of Computability, Complexity Theory
- Approximation, Randomness
- Cryptography
- DNA Computing, Quantum Computers
- How to Foil and Adversary



Programming Challenge

Write a self-reproducing program

- Instructive

(data encoding, simple algorithms, program generation)

- Needs programming environment

(otherwise you easily fool yourself into believing you solved it)

Tom's JavaScript Machine

Input:

abcdefgh

Program:

```
writeln(input.length);
```

Output:

8

GUI of *Tom's JavaScript Machine*: 3 text areas + *Run* button

Preparing Study Material for Tom's JavaScript Machine

_parseURI () opens web page with machine and initializes input, program, and output areas + parameters with values taken from URI:

```
.../machine.html?_program=...;_input=...
```

_machine_link () generates embedded hyperlink with given values for various machine parameters

_output_of () returns (as string) output of program given as string, (optional: input and separator)

_inject () injects given text with given background color: yellow for input, green for program, and blue for output

Low-threshold Facility for Introduction to Programming

- Tom's JavaScript Machine:

`www.win.tue.nl/~wstomv/edu/javascript`

- Zero install: runs in any (modern) browser
- Easy to make teaching material with embedded programs/output
- Adaptable: turtle graphics, event-driven GUI, web apps (DOM)
- Includes an instructive challenge with 40+ hints

Links

- Honors Class Informatics:

`www.win.tue.nl/~wstomv/edu/hci`

- Tom's JavaScript Machine:

`www.win.tue.nl/~wstomv/edu/javascript`

- Downloadable version of article:

`www.mii.lt/olympiads_in_informatics/htm/INFOL063.htm`