An Enticing Environment for Programming

Presented at

IOI Conference 2010

Waterloo, Ontario, Canada
18 August 2010

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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 an Adversary
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:

```html
.../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 with accompanying input/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