

## Honors Class (Foundations of) Informatics



11 October 2010 – 10 January 2011  
Ten lectures on Mondays 17:45 – 21:00

Tom Verhoeff  
and invited guest lecturers

Department of Mathematics & Computer Science  
Software Engineering & Technology

[www.win.tue.nl/~wstomv/edu/hci](http://www.win.tue.nl/~wstomv/edu/hci)

## Why?



Source: [http://larsv.files.wordpress.com/2009/05/bookshelf\\_preview.jpg](http://larsv.files.wordpress.com/2009/05/bookshelf_preview.jpg)

## Why?

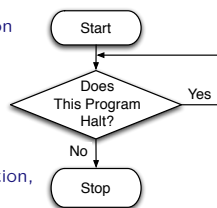
- Most computer science books/courses are about boring details, relevant only in the short term, not deserving the title 'science'
- Computer driving license
- Scientific foundations are important, long lasting, and fun

## The Science of Computing

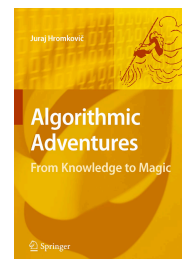
- Informatics is a **Science of the Artificial**
- Related to Mathematics
- A man-made world, limited only by our imagination
- Fundamental: *algorithm* and *information* play a role in all sciences
- Modern scientific models involve/describe *behavior/interaction*

## What?

- Algorithm, program, language, (cellular) automaton, universality
- Limits of (efficient) algorithms: computability,  $P \stackrel{?}{=} NP$
- Randomization, (numerical) approximation
- Cryptography
- DNA Computing, Quantum Computing
- Optional: Grammars, measuring information, error control codes, data compression



## Course Material



*Algorithmic Adventures*  
by Juraj Hromkovič  
Springer Verlag, 2009  
[www.springerlink.com](http://www.springerlink.com)

+ Various handouts