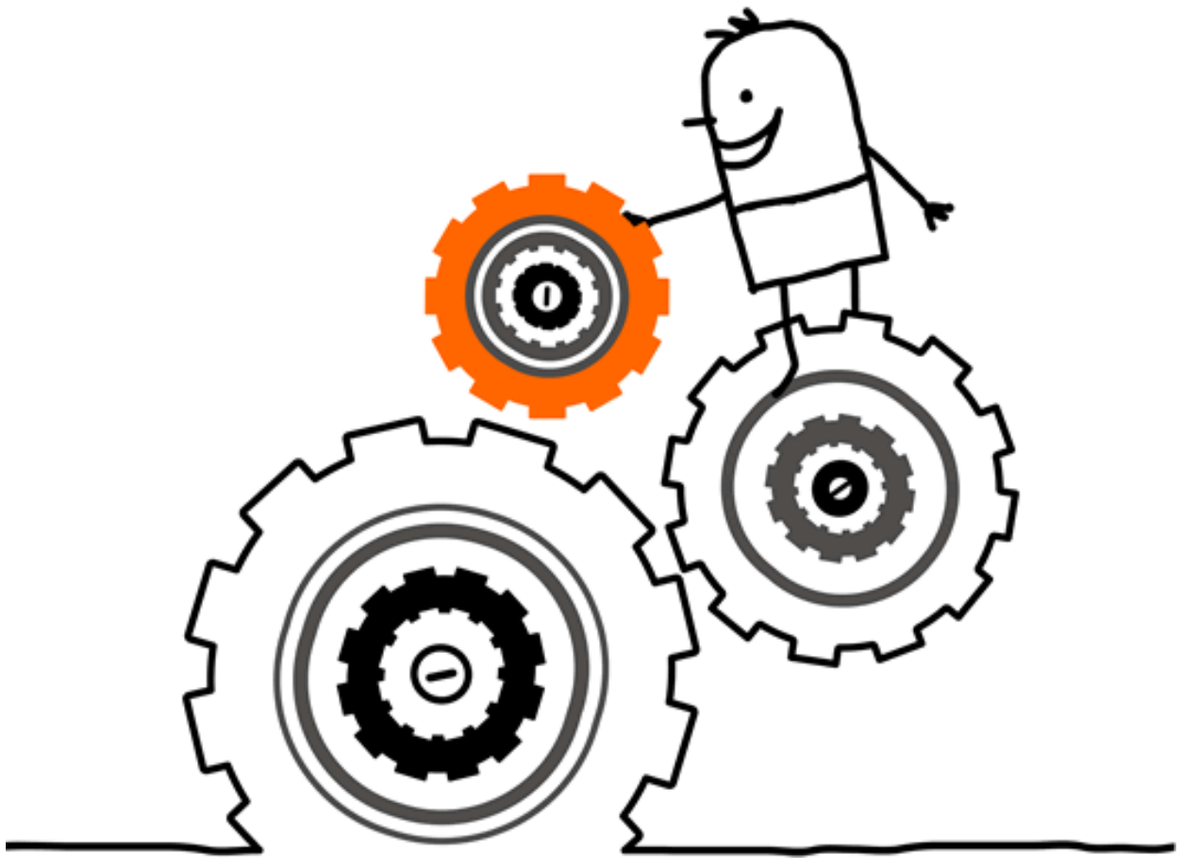
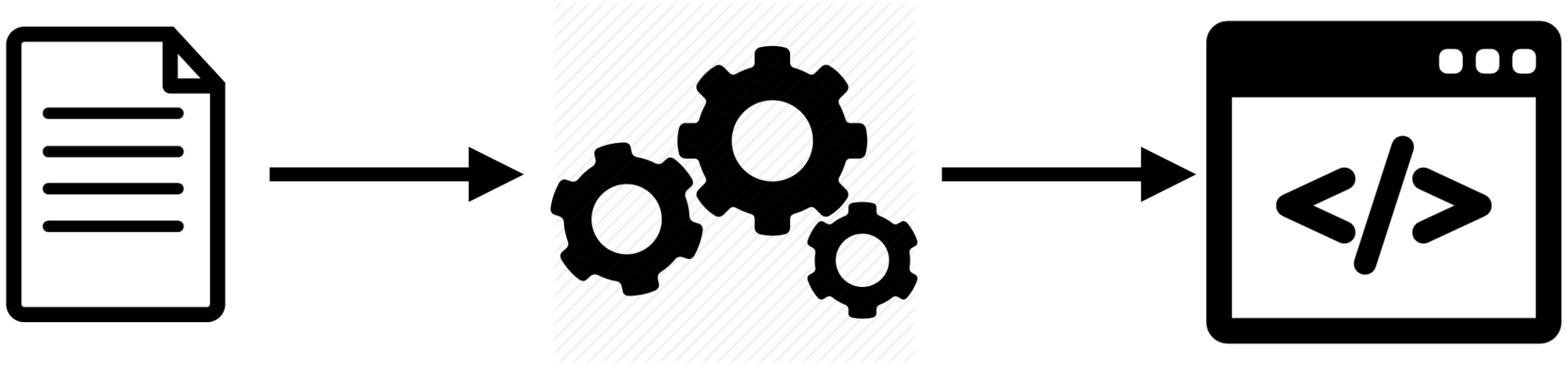
Program Synthesis

Seminar in Summer Semester 2019



What is program synthesis?

Spec



Program

Where can we use it?

[1] R.Bodik, B.Jobstmann. Algorithmic program synthesis: introduction. Int J Softw Tools Technol Transfer (2013) 15: 397

Program Synthesis

Reactive

Spec: Temporal Logic formula

Result: automata describing reactive system

Functional

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Spec: different variations

Result: program code

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Find a correct program from the candidate space

Candidate space defined

Semantically

Semantics preserving rewriting

- efficient
- correct by construction
- complete behavioural spec needed
- express only programs derivable with the set of axioms

Syntactically

Fitting language pattern (typically context-free grammar)

- flexible spec
- extra check for correctness needed
- express only programs that checker can validate

and some other approaches …

Organisation

- Biweekly sessions, date and time TBD
- Every session: 2 papers presented + discussion round
- Read 14 papers (in total)
- Present one paper - 40% of the final grade
- Moderate the discussion - 20% of the final grade
- Final report - 40% of the final grade

Questionary

https://goo.gl/forms/Brfn9s8zAXx7wAdP2

link is available on our website

www.in.tum.de/en/i02

How to Read a Paper

and take something away from it too

Run 1:

- abstract
- what does the paper present? (technique / tool / …)

Run 2:

- abstract + introduction + conclusion
- skim the rest - no details

Run 3:

- full text in detail

How to Read a Paper

and take something away from it too

- keep notes, questions as you read

  annotate the paper, or whatever suits you

- try to summarise it with your own words

  don’t copy or look at the abstract

- make a list of pro’s & con’s
- What are the key ideas and insights?

  may not be the same!

- What is new?

  you don’t have the background, but try to ‘guess’ from the paper itself

How to Make a Good Presentation

- 25 min max (please stick to the time!)
- imagine: you are the author and you are very excited about your work
- example structure
  - motivation: what's the problem? why do we care?
  - key ideas a.k.a. contribution
  - more details on the approach
  - your judgement: pros and cons explained; suggestions for improvement

How to Make a Good Presentation

there's an exception to every rule, but if in doubt:

- black on white
- few colors
- less (stuff on the slide) is more
- you may copy figures from the paper
- special effects **only** when necessary