

Algorithms for Model Checking (2IW55)

Domestic Announcements

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HG 6.76

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Course organisation:

- ▶ Lectures are (tentatively) organised as follows:
 - 6 September - 18 October (part I)
 - 15 November - 10 January (2012) (part II)
- ▶ Exam dates:
 - Thursday, 25 January, 2012, 9am - 12 noon
 - Wednesday, 20 April, 2012, 2pm - 5pm

Up-to-date course information and handouts are made available through:

<http://www.win.tue.nl/~timw/2IW55.php>

Bug-related health issues are communicated also through the above interface

Part I (basics):

- ▶ model checking subfamilies of CTL*
- ▶ computation of equivalences
- ▶ model checking of the μ -calculus

Tentative schedule:

6 Sep	The temporal logics CTL*, CTL and LTL: syntax and semantics
13 Sep	Fairness and Basic Model Checking Algorithms for CTL and fair CTL
20 Sep	Symbolic Model Checking for CTL
27 Sep	Symbolic Model checking: fairness and counterexamples
4 Oct	Equivalences and Pre-orders: State Space Reduction and Preservation of Properties
11 Oct	Mu-calculus
18 Oct	Exercises

Part II (advanced topics):

- ▶ μ -calculus model checking through Boolean equation systems
- ▶ Parity Games for model checking
- ▶ Symbolic μ -calculus model checking

Tentative schedule:

15 Nov	Boolean Equation Systems	
22 Nov	Parameterised Boolean Equation Systems	
29 Nov	Parameterised Boolean Equation Systems	
6 Dec	Parity Games	(Jeroen Keiren)
13 Dec	Parity Games	(Jeroen Keiren)
20 Jan	Parity Games	(Jeroen Keiren)
10 Jan	Q&A & Wrap-up. Exercises	
17 Jan	Exercises (Optional)	

Additional reading:

- ▶ Handouts (accessible via the website on occasions)
- ▶ Book: Model Checking. Edmund M. Clarke, Jr., Orna Grumberg, and Doron A. Peled. MIT Press, ISBN 0-262-03270-8
- ▶ Book: Principles of Model Checking. Christel Baier and Joost-Pieter Katoen. MIT Press, ISBN 978-0-262-02649-9 (mainly for the interested reader)

Note: Books not strictly required, as virtually all slides are self-contained.

Related Courses:

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| 4.1 | 2IF85 | Program Verification Techniques (R. Kuiper). |
| 4.1 | 2IW26 | System Validation (J.F. Groote). |
| 4.1 | 2IF96 | Seminar Formal System Analysis (H. Zantema). |
| 4.1 | 2IW15 | Automated Reasoning (H. Zantema). |