

Quantitative Verification

Chapter 9: Recent Advances

Jan Křetínský

Technical University of Munich

Winter 2018/19

Modern Verification

More complex models

- ▶ STA with non-determinism and data
- ▶ SHA
- ▶ Modest
- ▶ games: open systems, synthesis

52

More complex properties

- ▶ multi-objective
- ▶ quantiles
- ▶ conditional expectations
- ▶ probability transformers

More complex algorithms

- ▶ partial order reduction
- ▶ symbolic
- ▶ symblicit
- ▶ abstraction
 - ▶ lumping, bisimulation, regions & zones (subsumption)
 - ▶ game-based
 - ▶ cegar
- ▶ compositional
- ▶ statistical model checking
- ▶ machine learning (reinforcement learning, decision-tree learning)

Tools

- ▶ Modest toolset
- ▶ MRMC, IscasMC, Storm
- ▶ Plasma
- ▶ Rabinizer
- ▶ C2E2 (bloating simulations)
 - TuLiP (temporal logic)
 - HyST (hybridization, continuization)