

Infinite Games

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Two-player games of infinite duration have diverse applications in automata theory, logics, and in the verification and synthesis of reactive systems, e.g., emptiness of parity tree automata and model-checking fixed-point logics is equivalent to solving parity games. Furthermore, the LTL synthesis problem can be reduced to parity games.

In this talk, I give an introduction to such games by discussing three classical winning conditions, namely reachability, parity, and Muller. I will consider the main questions one is interested in: does the game always have a winner, how hard is it to determine the winner, and what kind of strategies does the winner need?

I conclude with a short outlook on advanced topics such as concurrent games, partial information, stochastic features, etc.

Here are the talk slides:

http://www.react.uni-saarland.de/people/zimmermann/slides/Scare_2014.pdf

Here is the link to the lecture notes on infinite games:

<http://www.react.uni-saarland.de/teaching/infinite-games-13-14/downloads/script.pdf>

and here is the link to the paper presenting a simple undetermined game on the web page of Damian Niwinski at Warsaw University:

<http://www.mimuw.edu.pl/~niwinski/Prace/ed.pdf>