

Advanced Logic

<http://www-sop.inria.fr/members/Martin.Avanzini/teaching/2023/AL/>

Martin Avanzini (martin.avanzini@inria.fr)

Etienne Lozes (etienne.lozes@univ-cotedazur.fr)

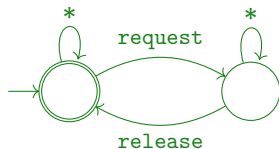


2nd Semester M1, 2023

Course Overview



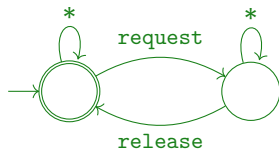
$$\forall x.\text{request}(x) \rightarrow \exists y.x < y.\text{release}(y)$$



Course Overview



$$\forall x.\text{request}(x) \rightarrow \exists y.x < y.\text{release}(y)$$



- ★ course material self-contained
- ★ course material and previous exams will be made available online

Course Overview

1. Logics

- (weak) monadic second order logic

$$\exists X.0 \in X \wedge \forall n.(n + 1 \in X \leftrightarrow n \notin X)$$

- Presburger arithmetic

$$\exists m.\exists n.m + n = 13 \wedge m = 1 + n$$

- linear time logic

$$\text{Globally}(\text{request} \rightarrow \text{Future}(\text{release}))$$

2. Automata

- (non-)deterministic finite automata
- tree automata
- Büchi automata

3. Automata Learning & Synthesis

Administratives

Requirements

- ★ followed a course covering **propositional** and **first-order logic**
- ★ familiarity with finite automata desired (course starts with brief introduction)
- ★ mastery of a **programming language** for mini project

Setup

1. 1/3 of lecture devoted to exercises 25% of grade
 - approx. 2 hours of work between slots
 - solutions presented in class
2. two programming exercises 25% of grade
 - you are free to pick your programming language
 - solutions presented in class
3. final exam 50% of grade