

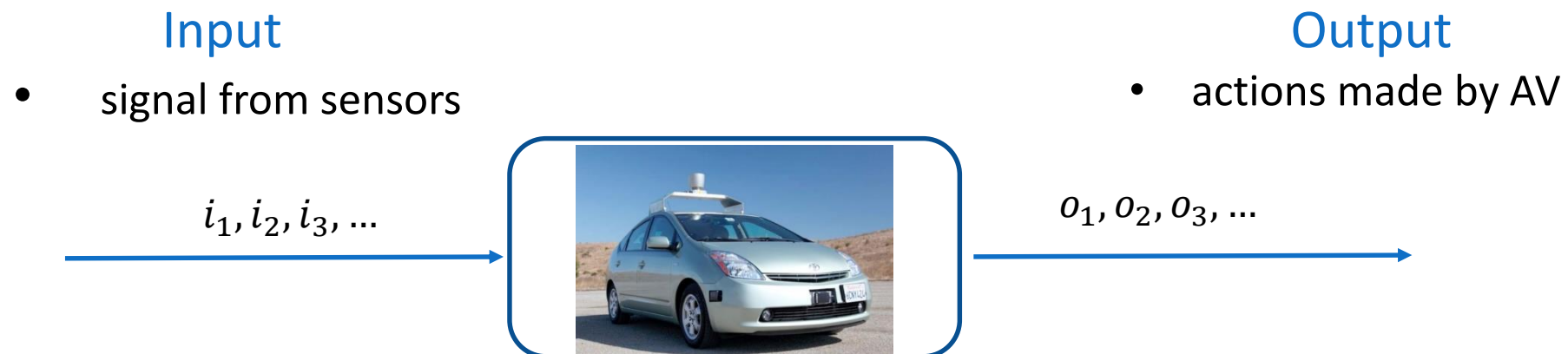
כנס מסטרנטים 2021

דרור פריד

Formal methods

- Formal abstraction of systems and specifications to mathematical models
- Reasoning over properties of the system
 - Does the system meet the specification?
 - Are two systems equivalent?
 - Can the (concurrent) system run into a deadlock?
- **Synthesis**: Automatically constructing a system from a given specification
 - Specification (declaration): logical expression
 - System (implementation): state machine, circuit, program

Synthesis: from a specification to a program



Synthesis: from a specification to a program

Input

- signal from sensors

i_1, i_2, i_3, \dots



Output

- actions made by AV

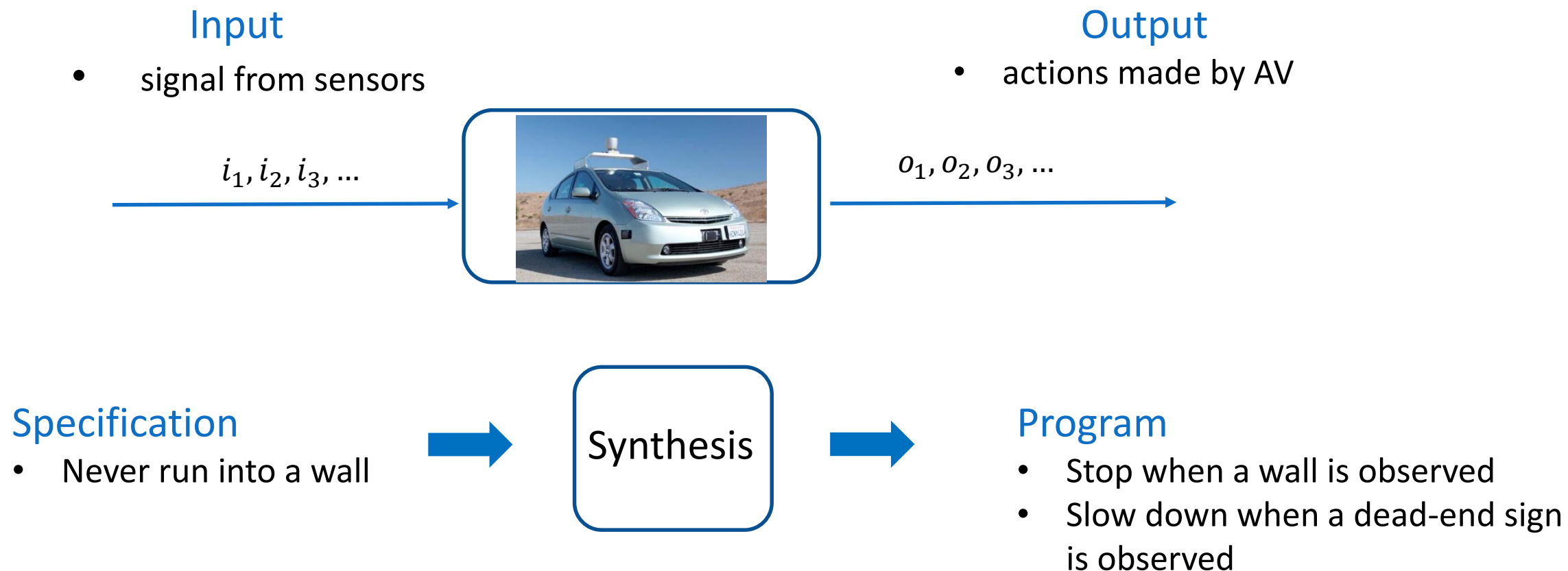
o_1, o_2, o_3, \dots

Specification

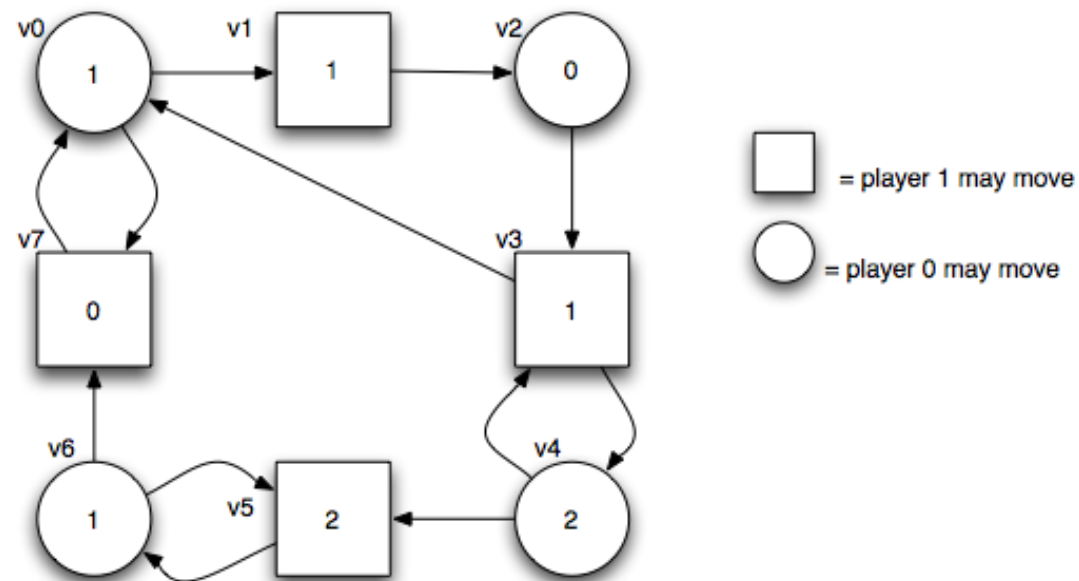
- Never run into a wall

Program

Synthesis: from a specification to a program



Synthesis: from a specification to a program



Synthesis: from a specification to a program

specification
(temporal logic)



game graph



Playing a 2 players game:
Environment vs. AV

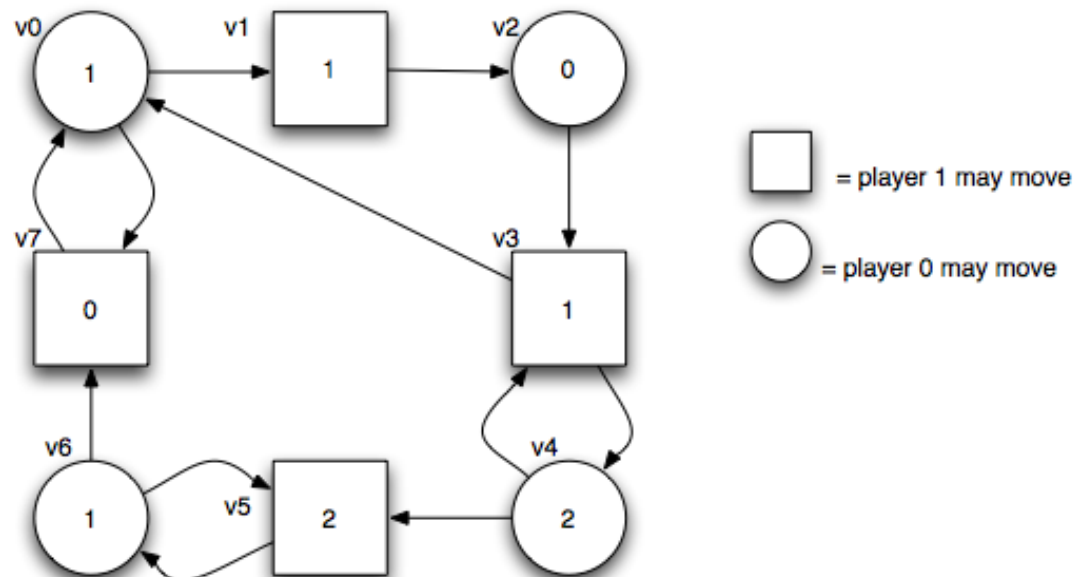


A winning strategy for player 1 (AV)
is our program!

2EXPTIME-Complete



constructing practical tools for synthesis



קהל היעד

- מי שמתעניין ב: לוגיקה, אוטומטים, תאוריה ואלגוריתמים, נוסחאות בוליאניות, מידול מערכות
- לקח לפחות 2 קורסים
- מומלץ הקורס: אימות ממוחשב של חומרה ותוכנה (22904)

יצירת קשר

- האחראית על הסמינרים/תזות
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