Introduction to the Course

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Purposes

- Recent work on the analysis of learning-enabled CPS.

- Background of reachability analysis.

- Background of set-based computation.

- Formal methods and numerical computation.

- Insight to the hardness of CPS verification.

- Flow* and POLAR.

Course Content

- We will focus on the **state feedback systems** which are simple but common structure for CPS.

- Reachability analysis of state feedback systems.

- Brief revisit to set-based representations for reachable sets.

- Interval and Taylor model arithmetic.

- Polynomial approximation and interpolation.

- Using verification tools.

senses

Controller

actuates

Plant
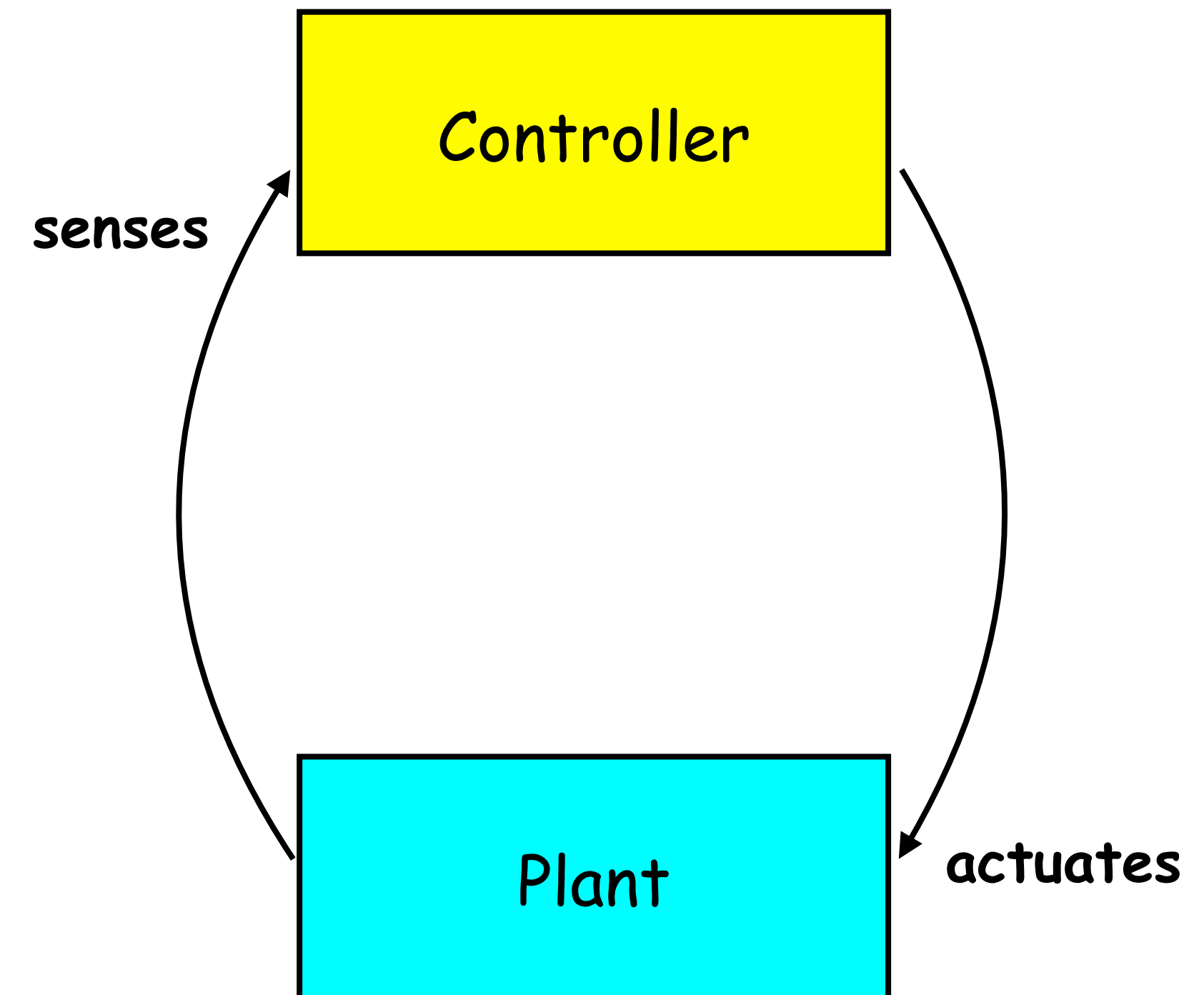
Assignments and Exercises

- Most of the assignments will be reading assignments.

- There are some implementation assignments using the library of some existing tools.

- In class exercises will also be given.