Reactive Synthesis

William Schultz

October 13, 2022

- The **verification problem** is: given system M and spec/property φ, check that $M \vDash \varphi$.
- The **synthesis problem** is: given spec φ synthesize M such that $M \vDash \varphi$.

The *deductive approach* [2] tries to synthesize an input/output program by extracting it from a realizability proof.

Temporal synthesis considers specifications given in the form of LTL, for example. Initial approach was to use satisfiability of a temporal formula as a way to derive M [1].

References

[1] Edmund M. Clarke and E. Allen Emerson. Design and synthesis of synchronization skeletons using branching time temporal logic. In Dexter Kozen, editor, *Logics of Programs*, pages 52–71, Berlin, Heidelberg, 1982. Springer Berlin Heidelberg.

[2] Zohar Manna and Richard Waldinger. A deductive approach to program synthesis. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 2(1):90–121, 1980.