Model Checking
Prof. B. Srivathsan
Department of Computer Science and Engineering
Indian Institute of Technology – Madras

Lecture - 17
Summary

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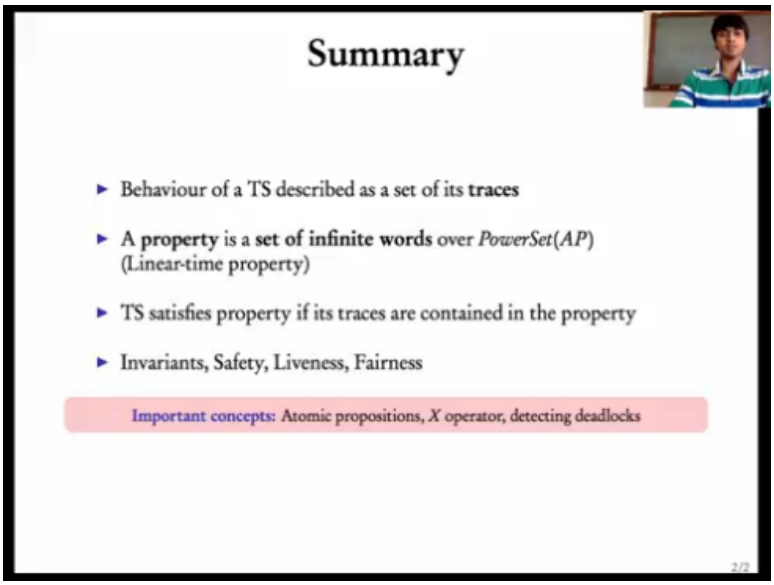

This brings us to the end of unit 3 on Linear-time properties. Let me summarize this unit. In this unit we have seen what atomic propositions are? Given a transition system we can define atomic propositions and describe the behavior of a transition system as a set of traces.

A property is then a set of infinite words where each letter consists of a set of atomic propositions. This is what is written here a property is a set of infinite words over Powerset AP. That is why we called it a Linear-time property. A transition system is set to satisfy the property if all its traces are contained in the property.

We have seen examples of this in module 2. We have also seen different kinds of properties called Invariants, Safety and Liveness. Invariants say that some Boolean expression over the atomic propositions is true on all reachable states of the transition system. Safety properties say that something bad does not happen.

That means it consists of all words where bad prefixes are avoided. Liveness properties say that something good happens infinitely often. They are useful to detect deadlocks. When we were checking Liveness properties we also came up with the notion of fairness.

In particular we use fairness in the dinning philosophers problem to filter out executions where for instance the main process is being continuously scheduled and the philosophers are not scheduled at all.

Some important concepts that need to remember from this unit are Atomic propositions, the X operator which is used to go the next state in the execution and then the idea of detecting deadlock in transition system.