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Embedded System Design

## StateCharts (6)

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An Overview of StateCharts

- **StateCharts is a language.**
- **CFSM MoC**
- **Communication**
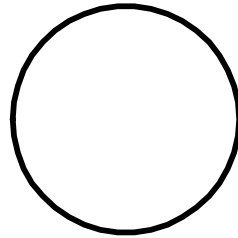 - **Shared Memory**
- **Deterministic FSM**

Modeling of Hierarchy

- **The key extension is hierarchy.**
  - **States comprising other states are called super-states.**
  - **States included in super-states are called sub-states of the super-states.**
  - **Each state which is not composed of other states is called a basic state.**
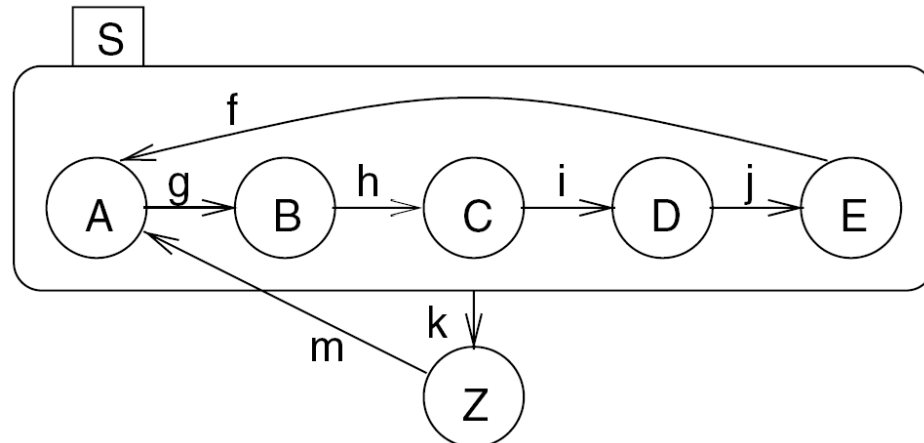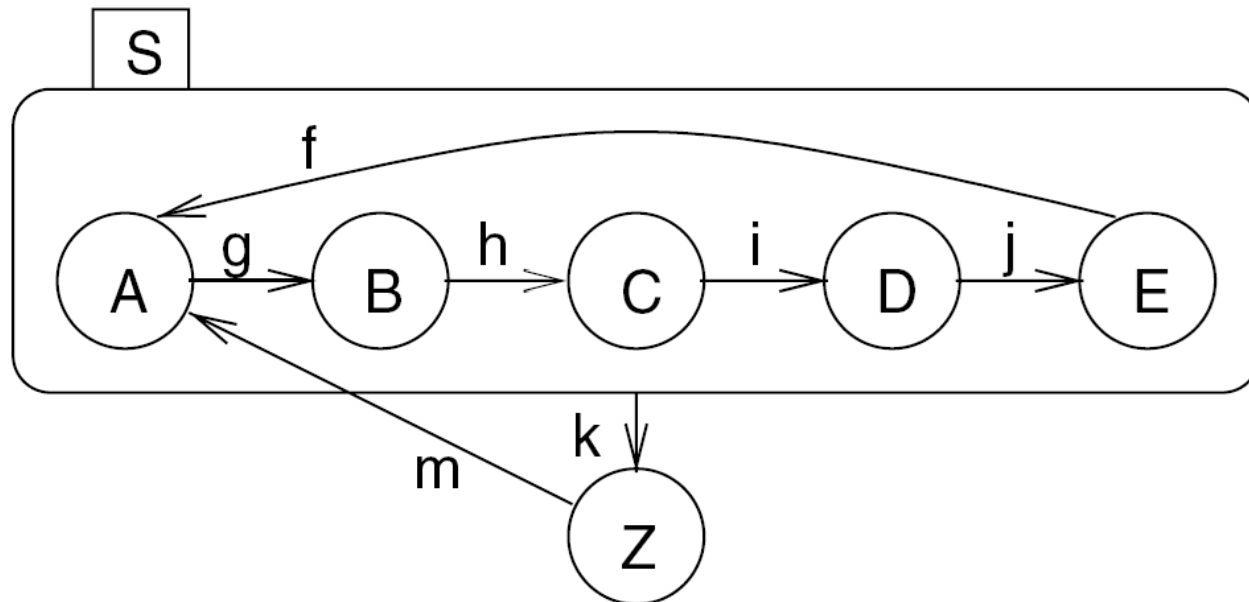
Super Nodes vs. Basic States

- **Basic states**

- **Super nodes**

OR-Super-States

- **The FSM can only be in one of the sub-states of super-state S at any time.**
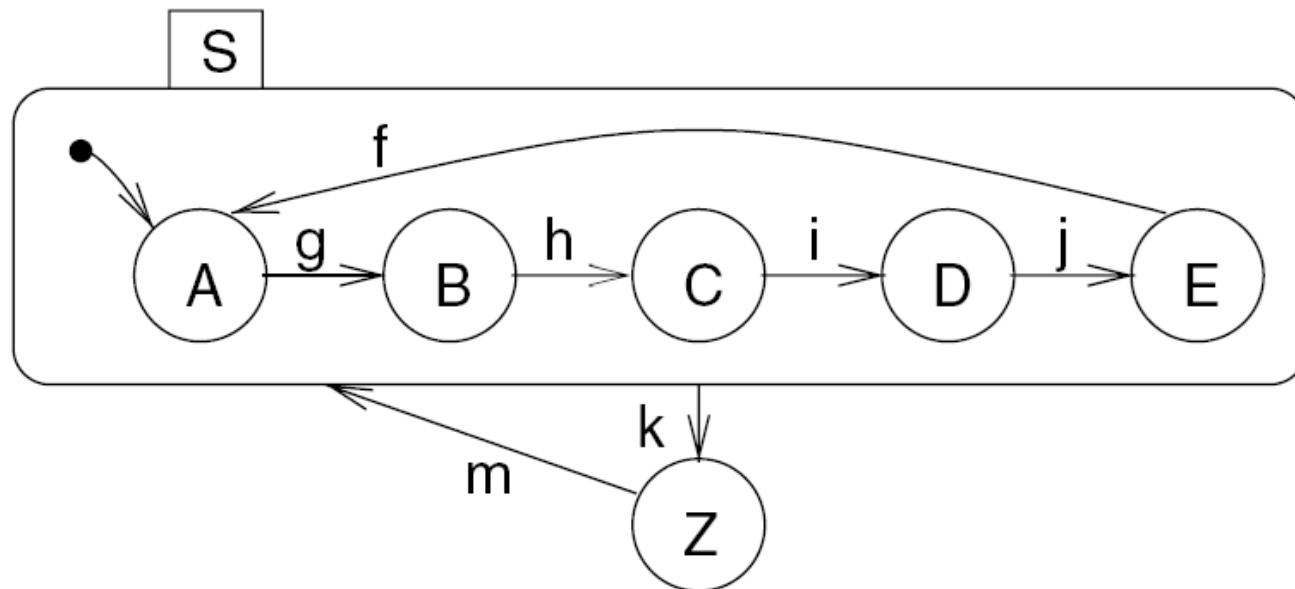
Design Modularity

- **There are to mechanisms to hide the internal structure of super-states from the environment.**
  - **Default State Mechanism**
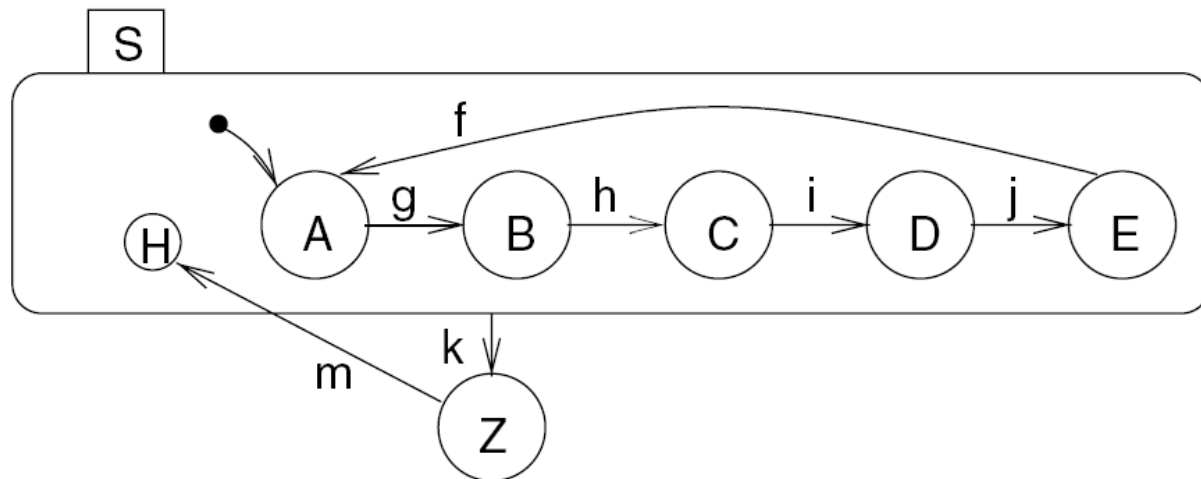 - **History Mechanism**

Default State Mechanism

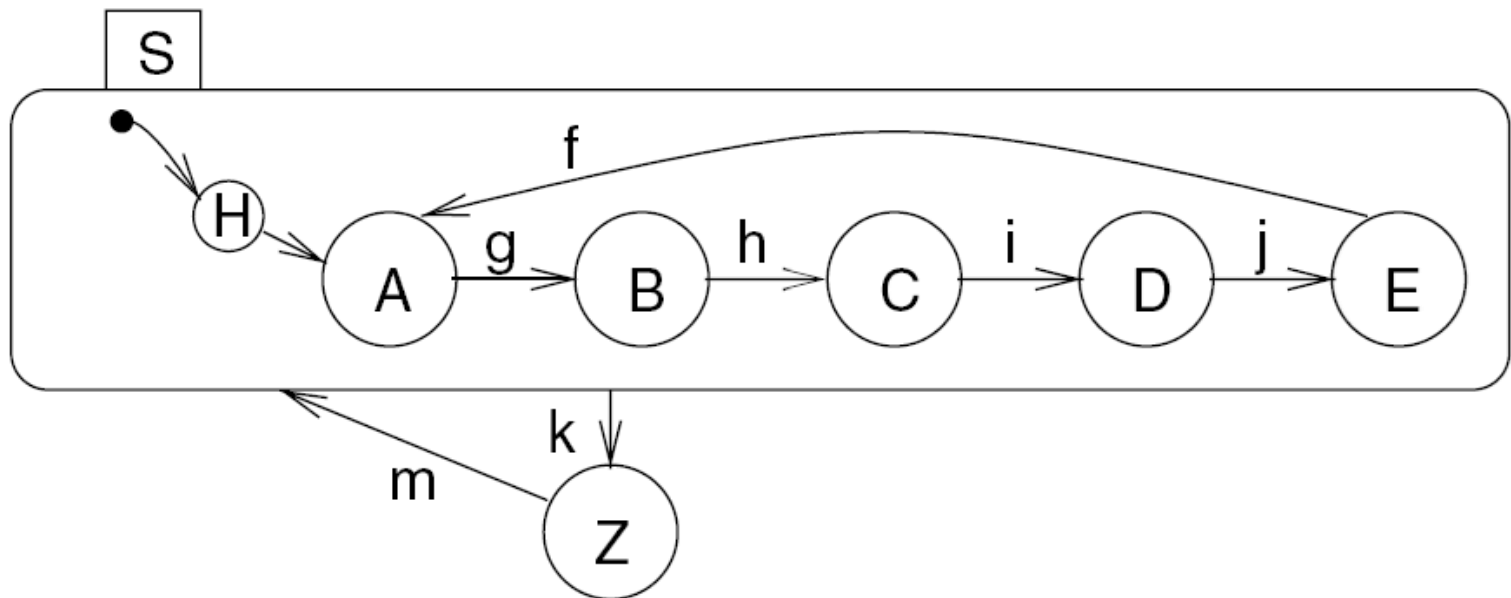- **Note that the filled circle does not constitute a state itself.**

History Mechanism

- **It is possible to return to the last sub-state that was active before the super-state was left.**

- **The filled circle defines the next state for the very initial transition into the super-state.**

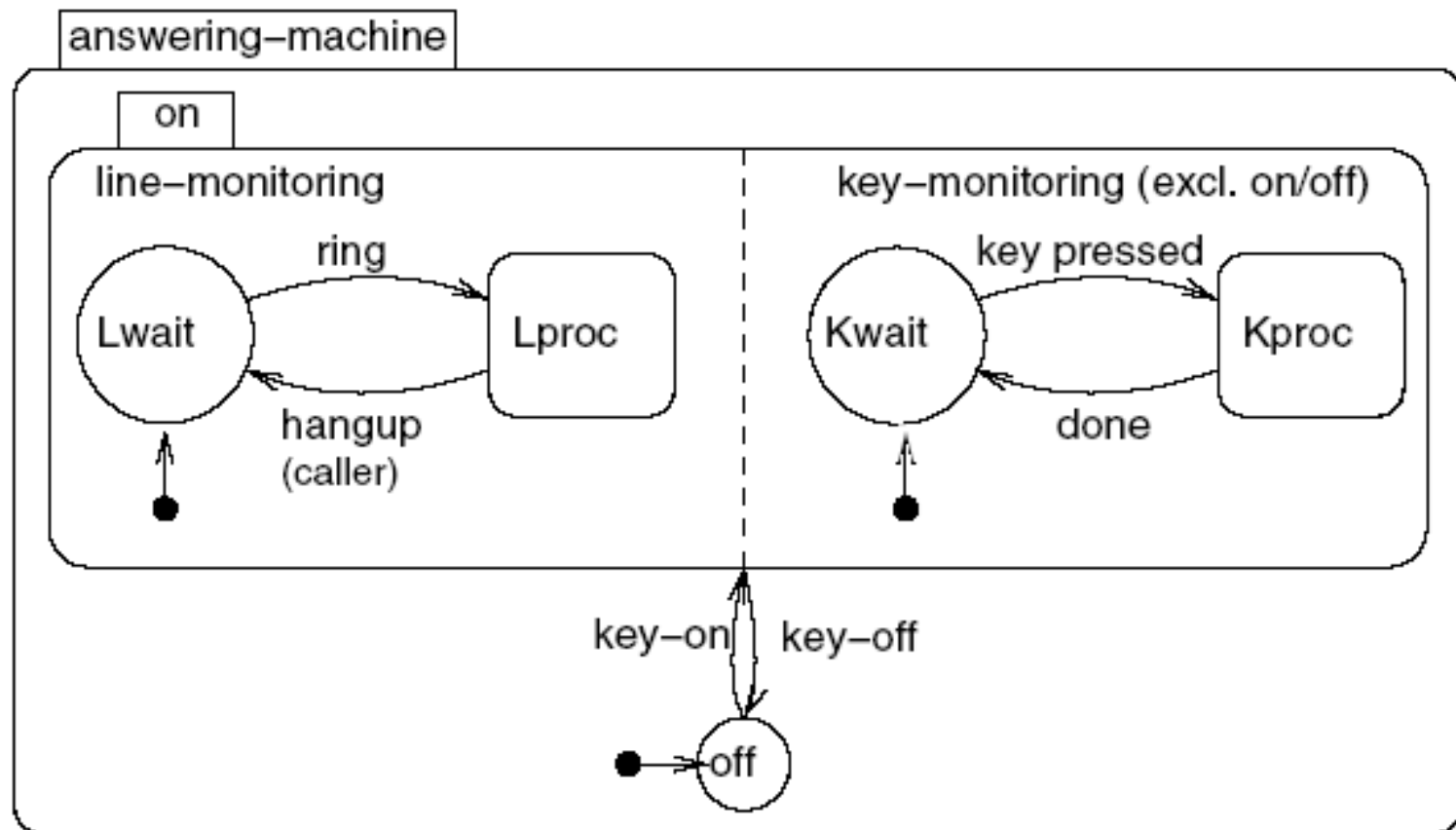# History Mechanism

- **Another notation (Equivalent to the previous one)**

AND-Super-States

- **The system containing an AND-super-state S is in all of the sub-states of S whenever it is in S.**

- **Also, transitions out of S always result in leaving all the sub-states of S.**

- **AND-super-states are used to describe concurrency.**

Example: Answering Machine

Example (Cont.)