

EVENT DRIVEN PROGRAMMING

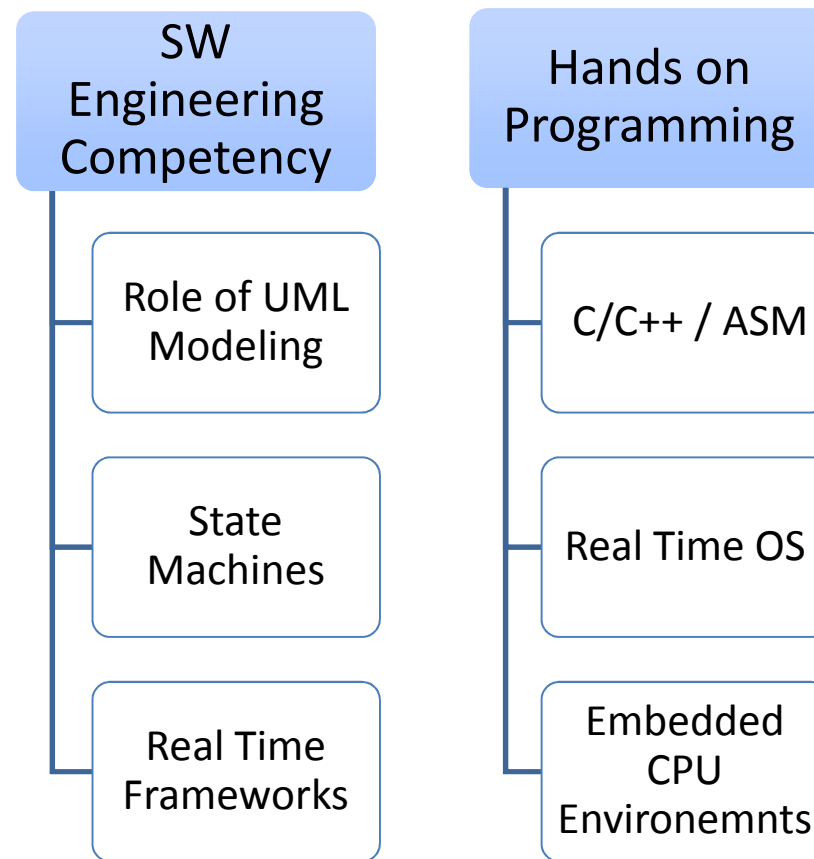
INTRODUCTION-2

- Embedded Real Time Systems
- Ron Barker

Review of Last Week

- Brief Overview of Course Goals
 - UML State Charts
 - State Machines
 - Frameworks
- Objectives for this Session
 - Introduction to HW / SW
 - Role of UML State Charts
 - State Machine Basics
 - Practical Exercise

Areas of Focus in this Seminar

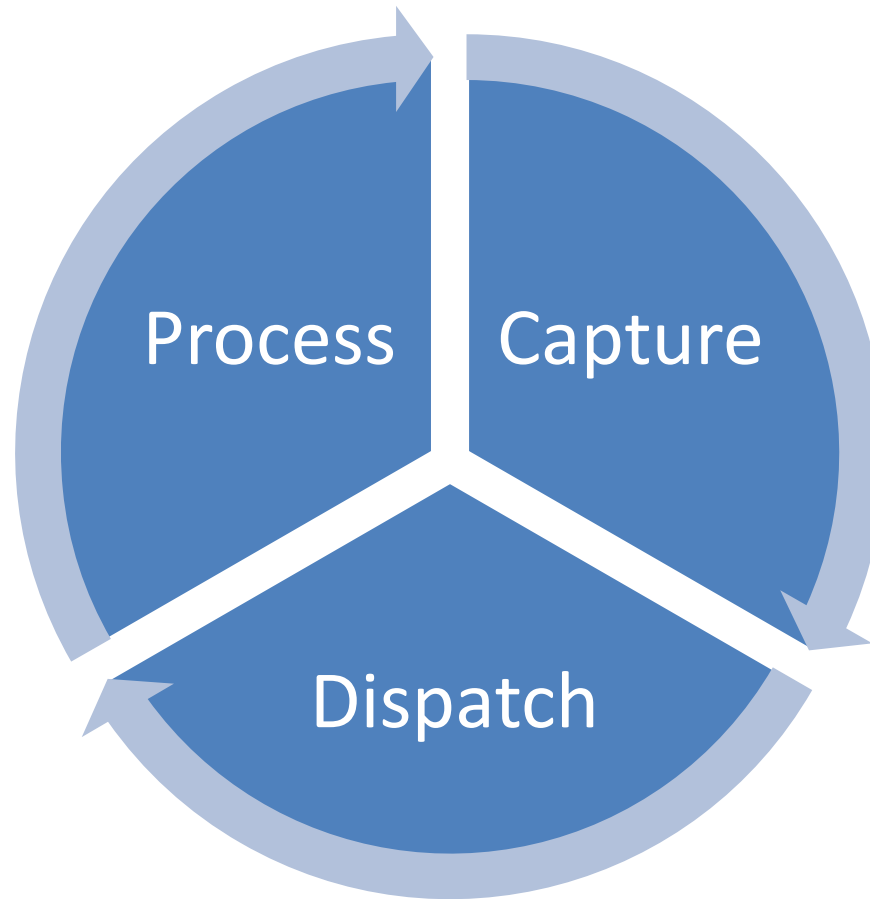


EVENT MANAGEMENT THROUGH STATE MACHINES

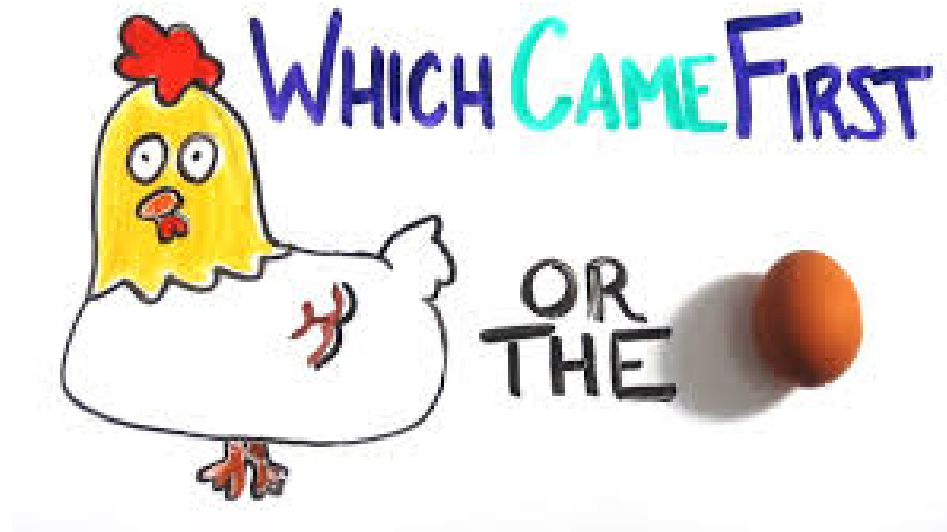
Generic State Machine Theory

- Formal definition of a finite state machine
- A 5-tupel: $(S, \Sigma, s, F, \delta)$
 - Where S = Set of States
 - Where Σ = *Set of Events*
 - Where s = *Initial state*
 - Where F = *Set of ending states* Where δ = *Transition function determining next state*

State Machine Implements the Event Management Cycle



De ratione machinae statis



Applied to State Machines

Events or Process???

Different Folks – Different Strokes



Basic State Machine Implementation Paradigms

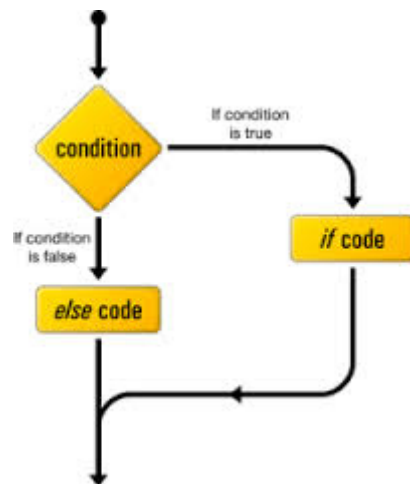
- Switch Case
- State Tables
- OO Methods

Basic Difference is event management

Event Management

- Two basic Architectures for Event Management

Procedural Model



Chaos Model (Inversion)



- Programming Model is function of Event Mgt

Contrast Programming Models

- Procedural Model

- Execution control

- Sequential progress
 - Main Loop in control

- Systems State

- Always in a sequential step
 - Result is a progression $A \rightarrow B$
 - Processing flow is deterministic
 - Events often stored in global variables

- Inversion Model

- Execution Control

- State Context Dependent
 - Function of Event Occurance

- System State

- Fuzzy
 - Specific objects

System Control is the Goal

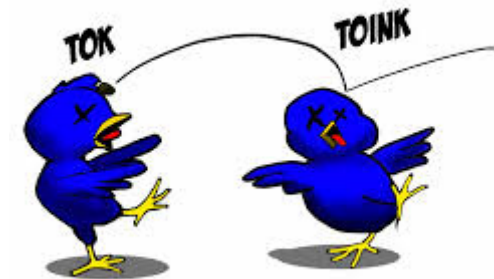
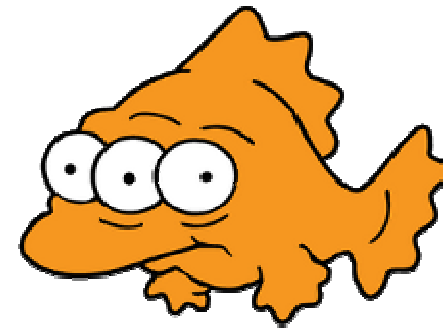
PROJECT ORIENTED LEARNING BLINKY & FRIENDS

3/26/2015

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Blinky

- The “hello world” of event driven programs!
- Opportunity to “kill 2 Birds”
 - Intro to Keil IDE
 - Intro to MCB23000



μVision – Tutorial

- Organize work groups / teams
- Access Repo:
 - : <https://redmine.cs.hm.edu/svn/2015-barker-eds>
- Checkout SVN to a working directory
 - Navigate to:
 - Projects/Seminars/EDS-SS15\ARM\ARM7\MCB2300\blinky
- Click on project „blinky“

Analysis of State Machine „Blinky“

- Event Capture:
 - How does blinky do this?
 - Which Element in SM Definition
- Event Dispatch
 - Implementation mythology?
 - Which Element in SM Definition
- Event Processing
 - Execution Control?
 - Which Element in SM Definition