PROGRAMMING FOR THE INTERNET OF THINGS PROJECT

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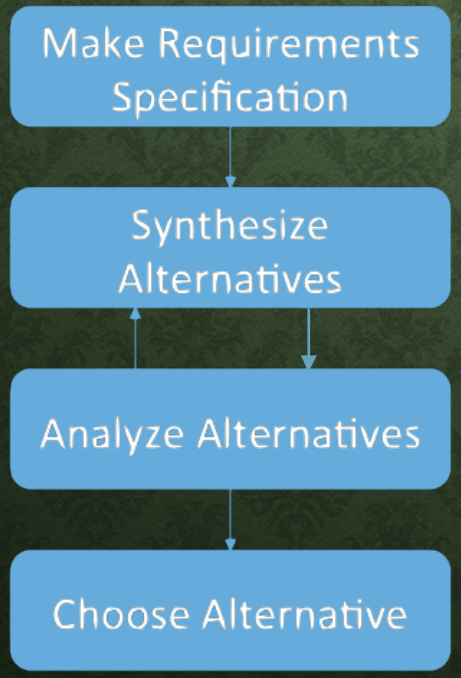
CAPSTONE DESIGN PROJECT

→Design and build a more complex system

- Complexity of a design = Sum of complexities of individual components + Complexity of their integration together
- Design process:



REQUIREMENTS SPECIFICATION

- Behavior of the systems: How the system acts (not implementation)
- Must be understandable by the user:

  →Describe how to use the device

- Must be understandable by the designer:

  →Describe behavior **completely**

  →**Describe rare cases and common cases**

- Real world constraints:

  ✓ Existing expertise (knowledge)

  ✓ Competing designs and patents (creativity)

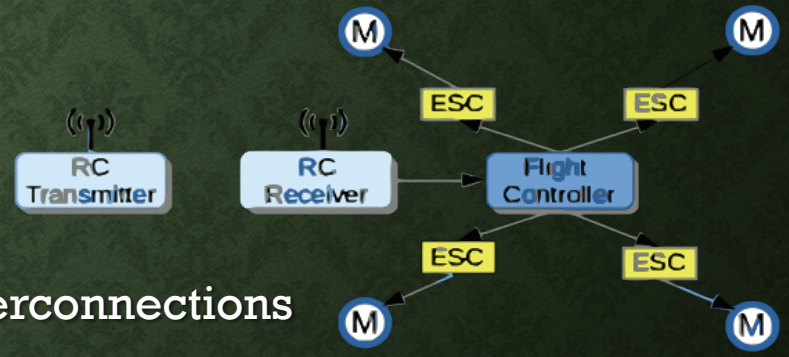
  ✓ Financial limitations

  ✓ Legal restrictions

PS: Don't assume background knowledge

DESIGN PROCESS

- System design:
  - System-level design, large-scale design → For bigger decisions
  - Design based to satisfy all constraints
  - Evaluate all possible options and alternatives:
    1. Enumerate
    2. Evaluate
  - PS: System block diagram → Show components and basic interconnections



- System decision:
  - How will the behavior be divided into HW/SW components?
  - Will components be pre-fabricated or built from scratch?
  - Do component interfaces match?
  - Decision based on constraints

TESTING

- Component testing:
  - Testing individual components
    1. Apply test data
    2. Observe test results

  PS: Test data should be complete → Cover all possibilities (+ rare cases)
- Integration testing:
  - Test groups of connected components together
  - Perform integration incrementally (one piece at a time, individually)