

home automation system



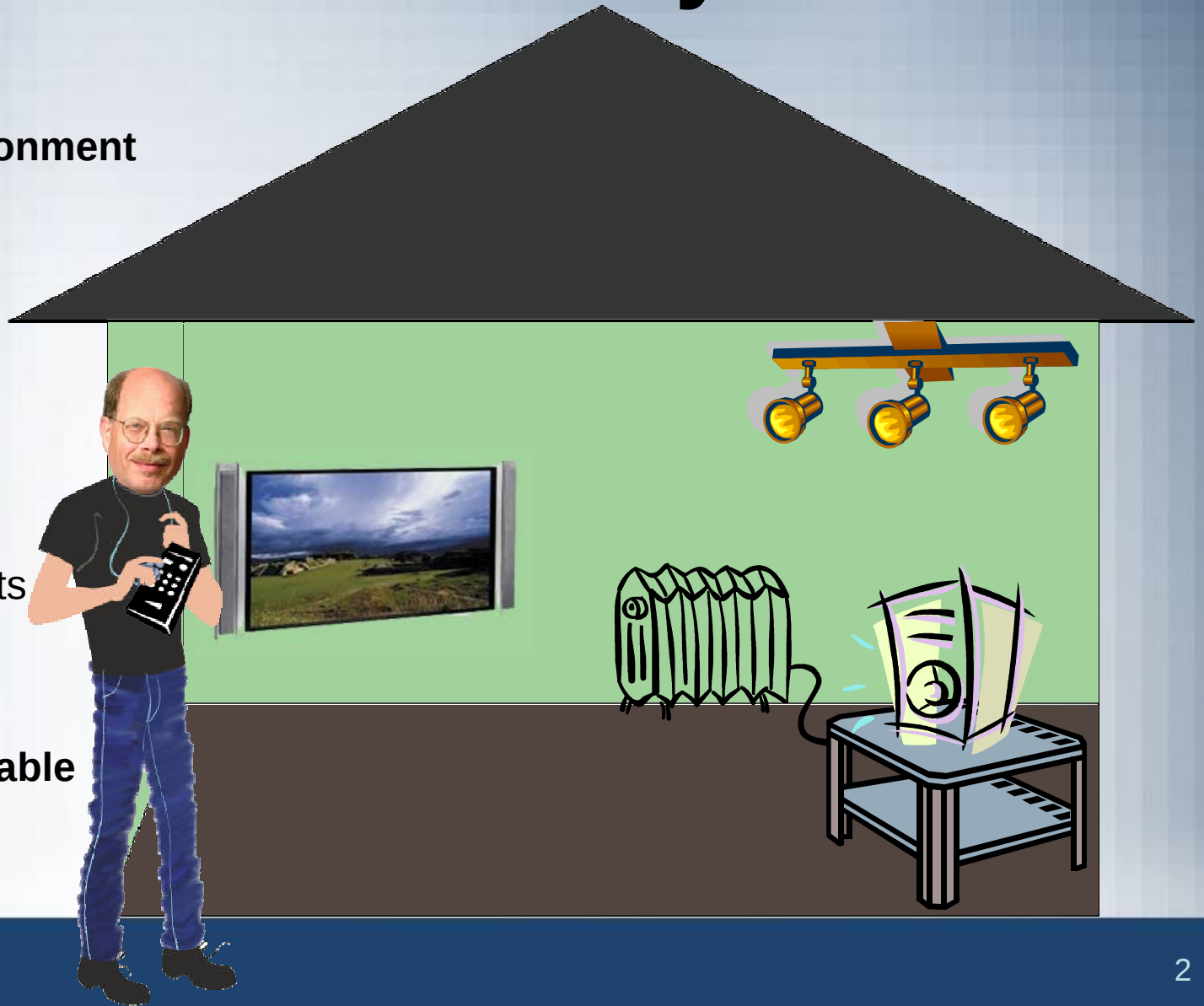
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James Psota

vision: 21st century home

Intelligent Environment

- lighting
- audio/video
- home theater
- climate control
- security
- scheduled events

Fully Programmable



project goals

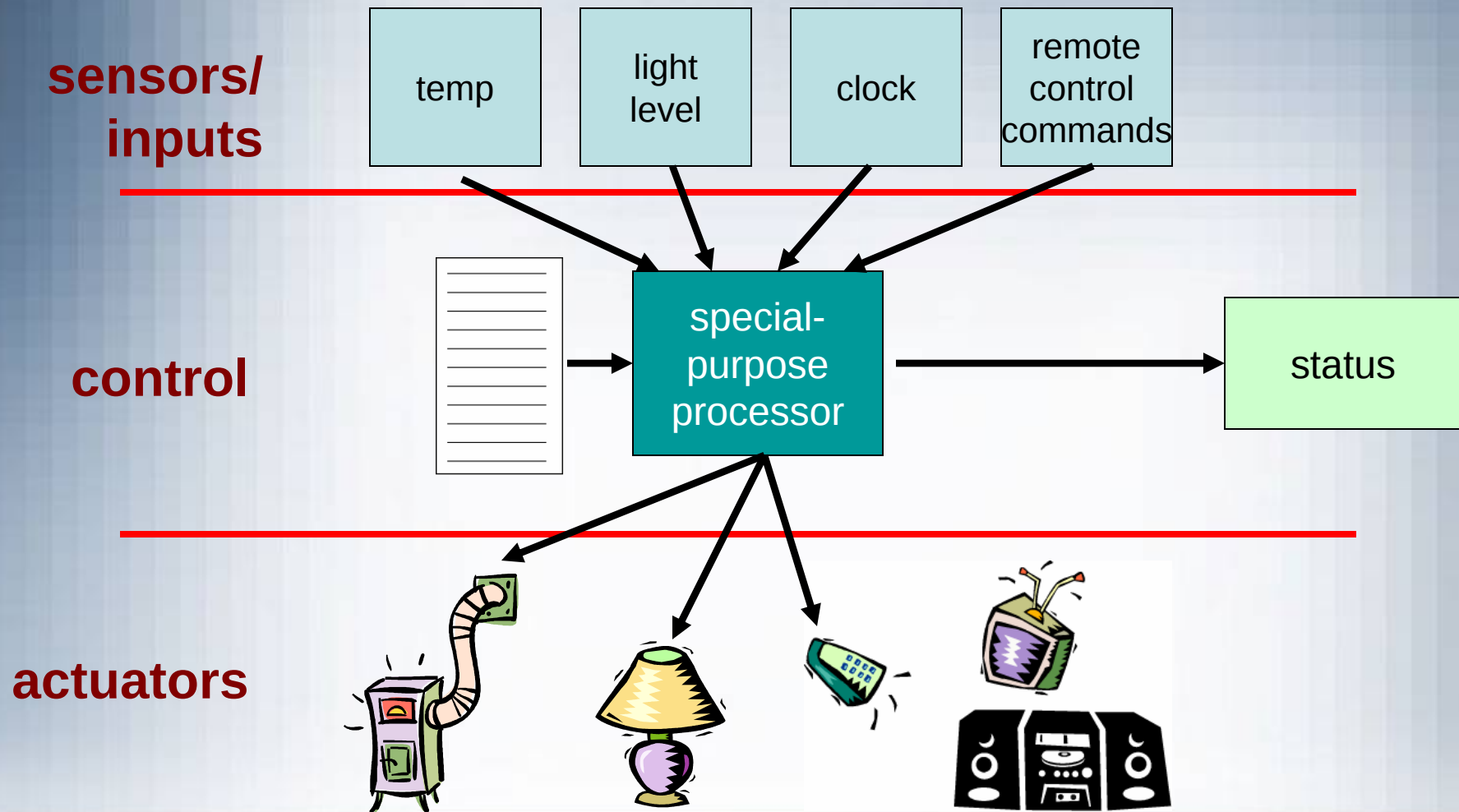
Design

- Flexible
 - generally programmable
- Extensible
 - adding additional features easy
- Modular
 - no need to redesign control when new sensor is added

Function

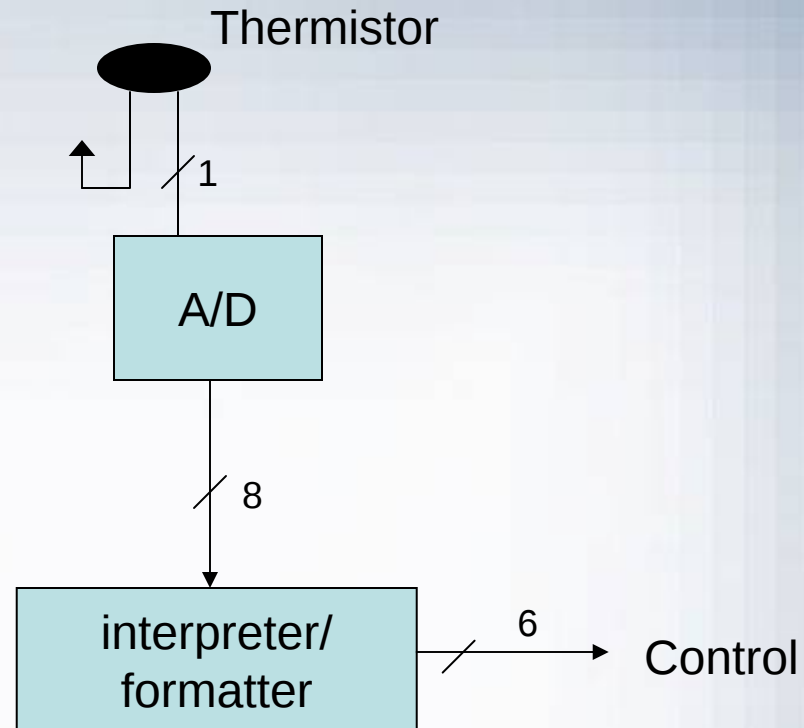
- control via IR remote
- climate & lighting automation
- schedule-based events

3-layer system architecture



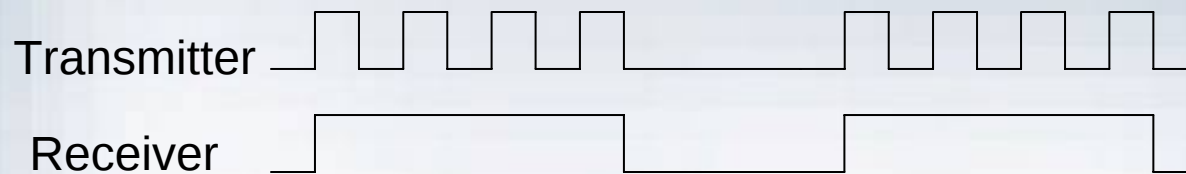
Sensor Input Layer: Climate Interpreter

- measures ambient temperature in room and reports it to control unit
- lighting sensor is analogous

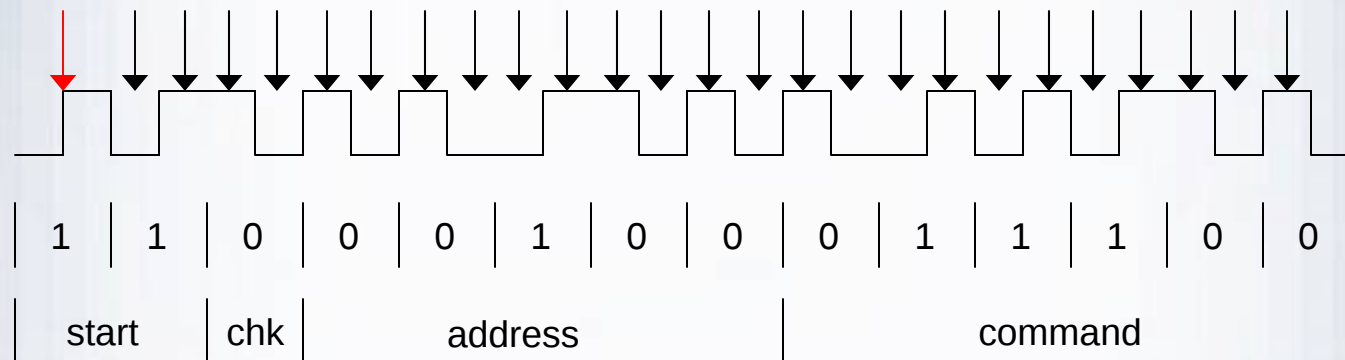


Sensor Input Layer: IR Remote Control

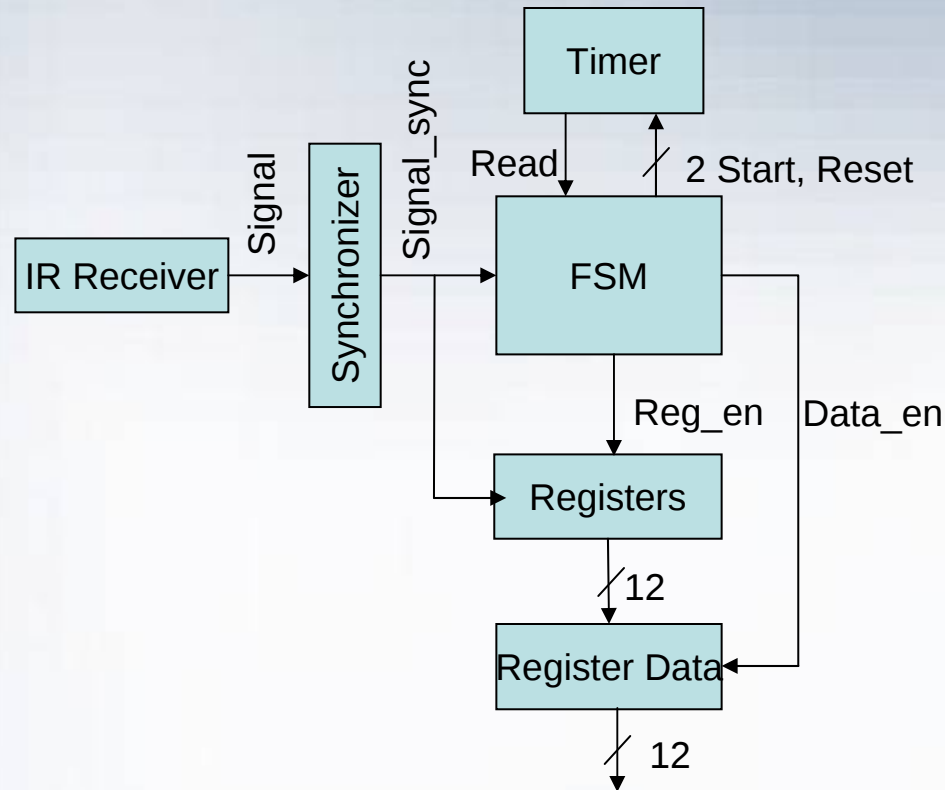
- Data Transmission



- Phillips RC-5 Encoding



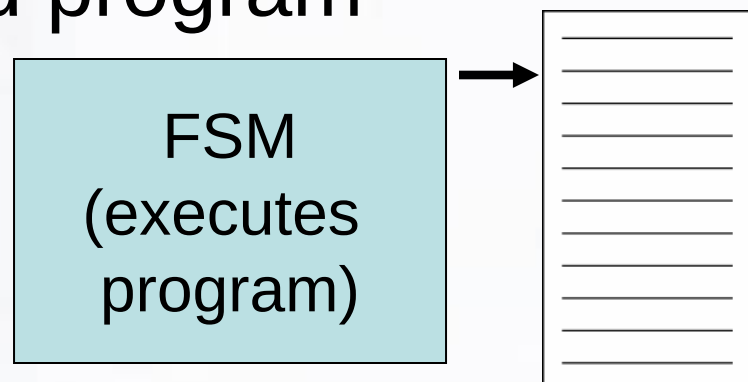
Sensor Input Layer: IR Remote Control



IR Decoder Module Block Diagram

control unit

- *purpose: apply condition to inputs if condition is true, perform program-specified action by asserting/deasserting actuators*
- special-purpose processor runs user-specified program



instruction format

- format

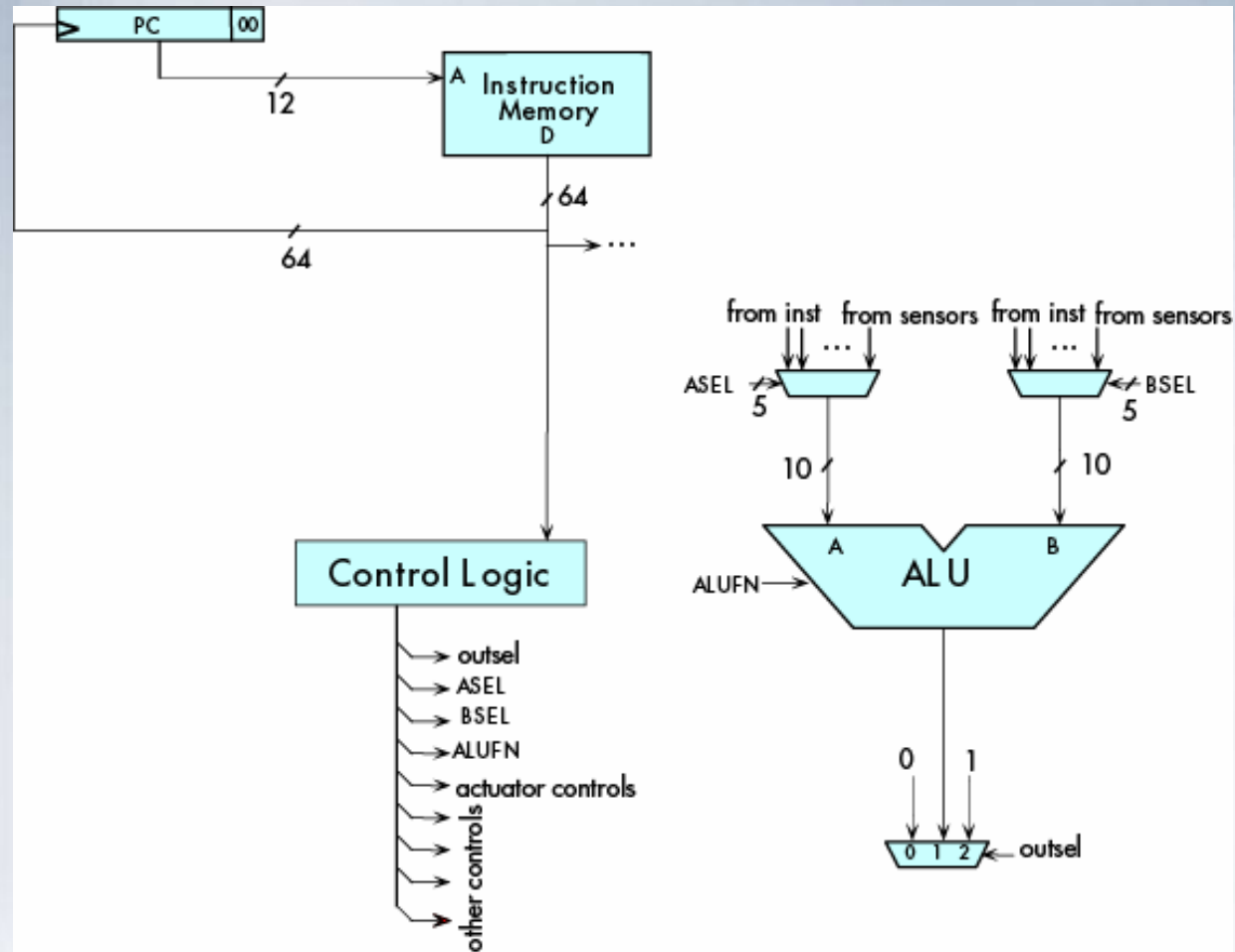
op	v1	v2	signal	output_value	next_pc
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- example

- turn on heat (signal 0x31) when temp (signal 0x12) is less than 68 degrees

<	s-0x12	i-68	0x31	0x1	0x0088
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truth engine architecture



Actuator Layer

- Outputs
 - Heating Unit
 - Lights
 - Extension: IR Transmission (e.g., TV, Stereo)

Neat Things

- Play with IR
- Build and experiment with a processor
- Implement something we can use in the real world

Questions?