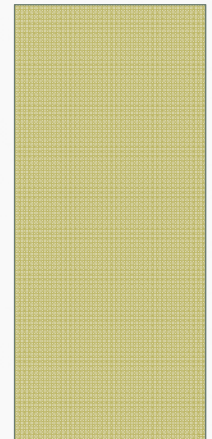# AGENTS

JEFFREY L. POPYACK

AGENTS

- What is an agent?

- How does it know what to do?

AGENTS

- **What is an agent?** *(responses from previous classes)*
  - carries out a job for an outside party
  - acts on its own
  - decision-making characters in video game
  - swarms of {insects, animals, cells} (multi-agent)
  - rain-detecting windshield wipers
  - entity that interacts w/ environment
  - makes decisions according to environment
  - trading bots
    - actual trading
    - giving advice to traders
    - simulation
  - make decisions w/o human intervention
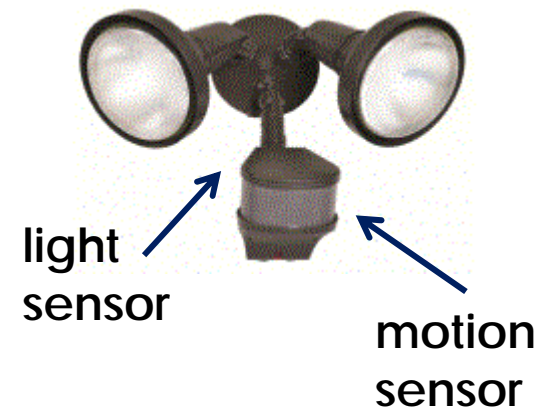 - (autonomous?)

AGENTS

- **How does it know what to do?**
  (responses from previous classes)
  - sensors to help detect wet windshield
  - trigger: based on info, involves action
    - windshield wipers
    - trading bots
  - reacts to its environment:
  - has a boss?
  - built in knowledge
  - sensors
  - can learn from situations
    - "trial and error", learn from mistakes, etc.
    - collect into, generalize from outcomes, etc

EXAMPLES

- **Lantern**
  - Turns on at dusk
  - Turns off at daylight
  - Action:
    - turns light on
    - turns light off
    - acts on its own
    - Sunlight
  - Environment
    - outdoors
    - yard
    - sunlight/ darkness (night, bad weather)

light sensor

motion sensor

EXAMPLES

- ## Automated Sprinklers

heat sensor
(wax plug)

Timer
Moisture sensor

EXAMPLES

- **Room Lighting**
  - Heat sensors to detect "presence of humans"
  - Motion sensors
  - Sound detection

EXAMPLES

Online chat bot resource for tax help
- recognize words in questions
- parse sentences
- figure out approximate meaning
- locate appropriate answers in some guidebook
- relay the response

"Smart Pen"
- recognize who is holding it?
- store info, e.g. motions
- data smoothing?
- prediction? _
- text recognition, etc,
- voice recognition

CLASSIFYING AGENTS

P E A S

- <u>P</u>erformance Measure:
  - *how you measure if it's doing its job*
  - speed, accuracy, cost, quality, safety, reliability ....
- <u>E</u>nvironment:
  - where it operates
  - who/what it interacts with, etc.
- <u>A</u>ctuators:
  - things it performs actions with
- <u>S</u>ensors:
  - how it collects its info
  - cameras, microphones, ...
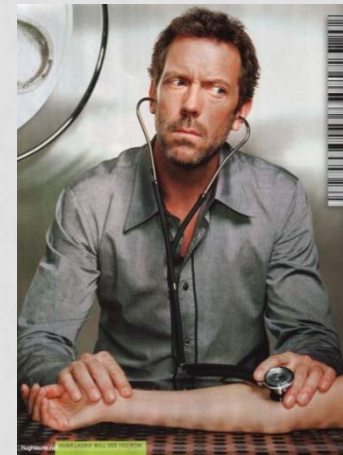
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  - Reflex agent -observes and reacts ["Eliza"]
  - Logical agents
  - Learning agents

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- **Single vs. multiple agents**