Exam 1 Review

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# Notes from Instructor

# Topics

# PowerPoint Review

## Ch1- Intro

51 Slides

### 1-15 Intro

### 16-33 What is AI?

|  |  |  |
| --- | --- | --- |
|  | Humanly | Rational |
| Thinking | * Machines with minds * decision making * problem solving/ learning | * Models of mental faculties |
| Acting | * Making computers do things, at which the moment, humans are better | * Inteligent agents |

#### Acting Humanly

#### NLP - natural language processing for communication

#### Knowledge Representation - to store what it knows or hears

#### Automated reasoning - use stored information to answer questions or draw new conclusions

#### Machine learning – adapt to new circumstances

#### Computer Vision - perceive objects

#### Robotics - manipulate objects

#### Three ways to achieve thinking humanly:

#### through introspection—trying to catch our own thoughts as they go by;

#### through psychological experiments—observing a person in action; and

#### through brain imaging—observing the brain in action.

#### Thinking Rationally

#### Aristotle and his syllogisms provided template for “right thinking”

#### Acting Rationally

#### Agent – something that does or acts

Rational agent – acts or does to achieve a measurable outcome

### 34-36 Foundations

### 37-38 History

### 39-49 State of the art

### 50-51 Summary

#### The chart above shows the distinctions of the different branches of AI

#### Thinking vs behavior

#### Human vs ideal standard

#### Ration action is the focus of the course

## Ch2 – Intelligent Agents

117 Slides

### 1-4 Intro

### 5-17 Agents and Environments

#### Agent – anything that perceives its environment through sensors

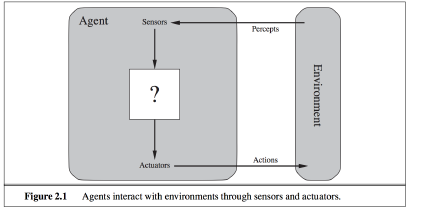
#### Percept – refers to the agent’s perceptual inputs at any given instant

#### Percept sequence- complete history of everything agent has perceived

#### Agent function – maps any given percept sequence to an action in terms of a mathematical expression

#### **/\ and \/ These two definitions sound similar, but are important to distinguish**

#### Agent program – concrete implementation, running within a physical system



#### human agent

#### **has:**

#### eyes, ears, and other organs for sensors and

#### hands, legs, vocal tract, and so on for actuators.

#### robotic agent

#### **might have:**

#### cameras and infrared range finders for

#### sensors and various motors for actuators.

#### A software agent

#### **Receives:**

#### keystrokes, file contents, and network

#### packets as sensory inputs

#### **acts on the environment by:**

#### displaying on the screen, writing files, and sending network

#### packets.

### 18-38 Good Behavior

#### Good behavior is determined by how well the agent performs

#### Measurement occurs:

#### 1 from the reference frame of the environment state

#### 2 what one wants in the environment

#### Rational Agent criteria

#### 1 performance measure

#### 2 agents’ prior knowledge

#### 3 actions availed

#### 4 percept sequence to data

#### Omniscience, Learning and Autonomy

Omniscience- knowing the outcome of all given actions

#### Rationality - is not perfection because most complex environments will have some degree of chaos

#### Information gathering:

#### 1 performing actions to modify future percepts

#### 2 exploring

Autonomy – the extent to which an agent relies on the knowledge of its designer rather than it’s own percepts

### 39-58 Nature of Environments

### 59-117 Structure of Agents

## Ch3- Solving by searching

103 Slides

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### 

## Ch4- Beyond Classical Search

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