Modul : Intelligent Agent

P E A S

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Inteligensi Buatan
(Artificial Intelligence)

P E A S

Performance Measure

Environment

Actuators

Sensors

By: Strader
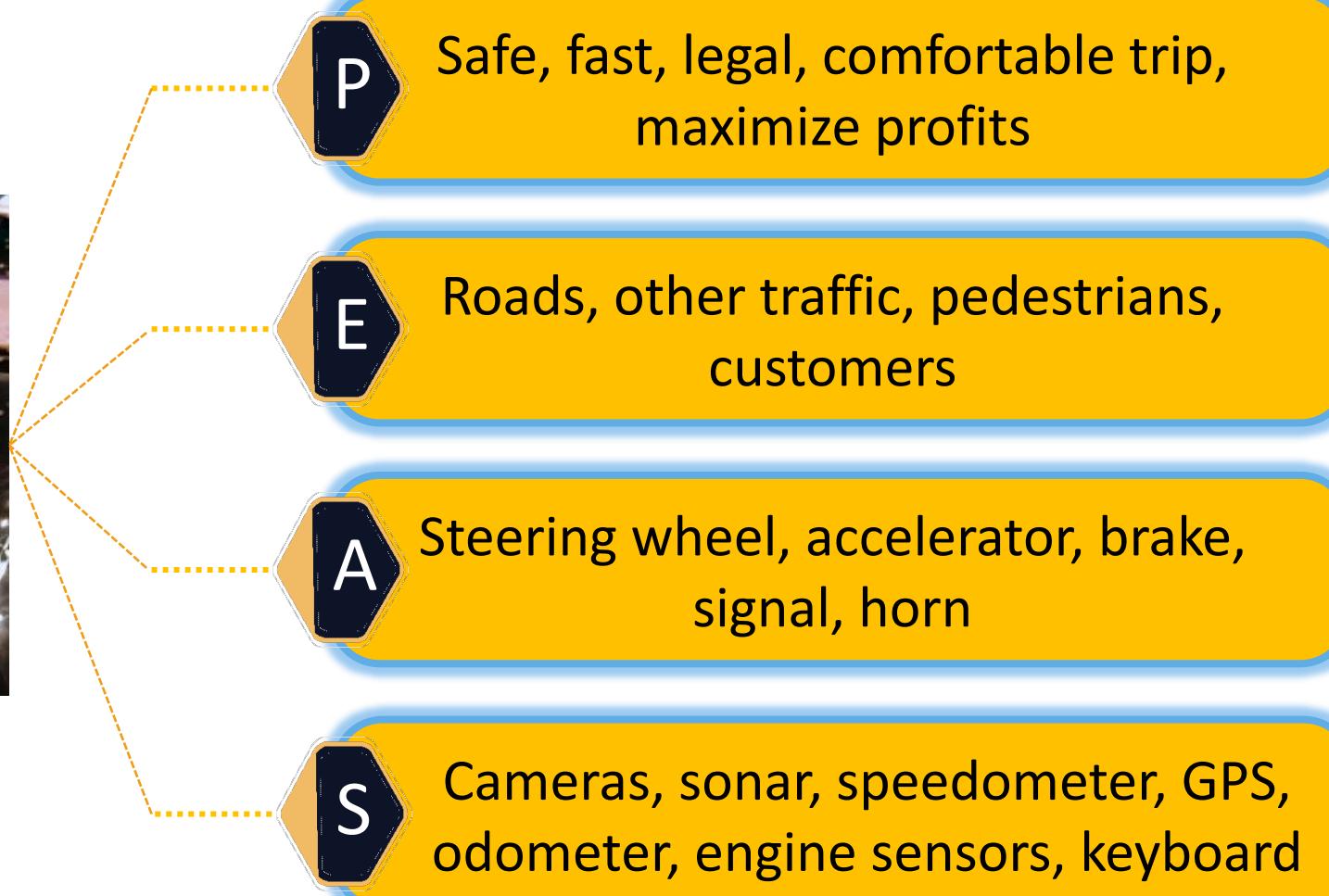
Example: Designing an Automated Taxi Driver

P Safe, fast, legal, comfortable trip, maximize profits

E Roads, other traffic, pedestrians, customers

A Steering wheel, accelerator, brake, signal, horn

S Cameras, sonar, speedometer, GPS, odometer, engine sensors, keyboard

http://www.gettyimages.com/detail/83988175/Stone

Example: Medical Diagnosis System Agent

P — Healthy patient, minimize costs, lawsuits

E — Patient, hospital, staff

S — Keyboard (entry of symptoms, findings, patient's answers)

A — Screen display (questions, tests, diagnoses, treatments, referrals)

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Task Environments

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Task Environment

Fully vs Partially Observable

Deterministic vs Stochastic

Episodic vs Sequential

Static vs Dynamic

Known vs Unknown

Semidynamic

Discrete vs Continuous

Single vs Multi Agent

Examples

Fully vs Partially Observable	Chess with a clock	Chess without a clock	Taxi driving
	Fully	Fully	Partially
Deterministic vs Stochastic	Deterministic	Deterministic	Stochastic
Episodic vs Sequential	Sequential	Sequential	Sequential
Static vs Dynamic	Semidynamic	Static	Dynamic
Discrete vs Continuous	Discrete	Discrete	Continuous
Single vs Multi Agent	Multi Agent	Multi Agent	Multi Agent
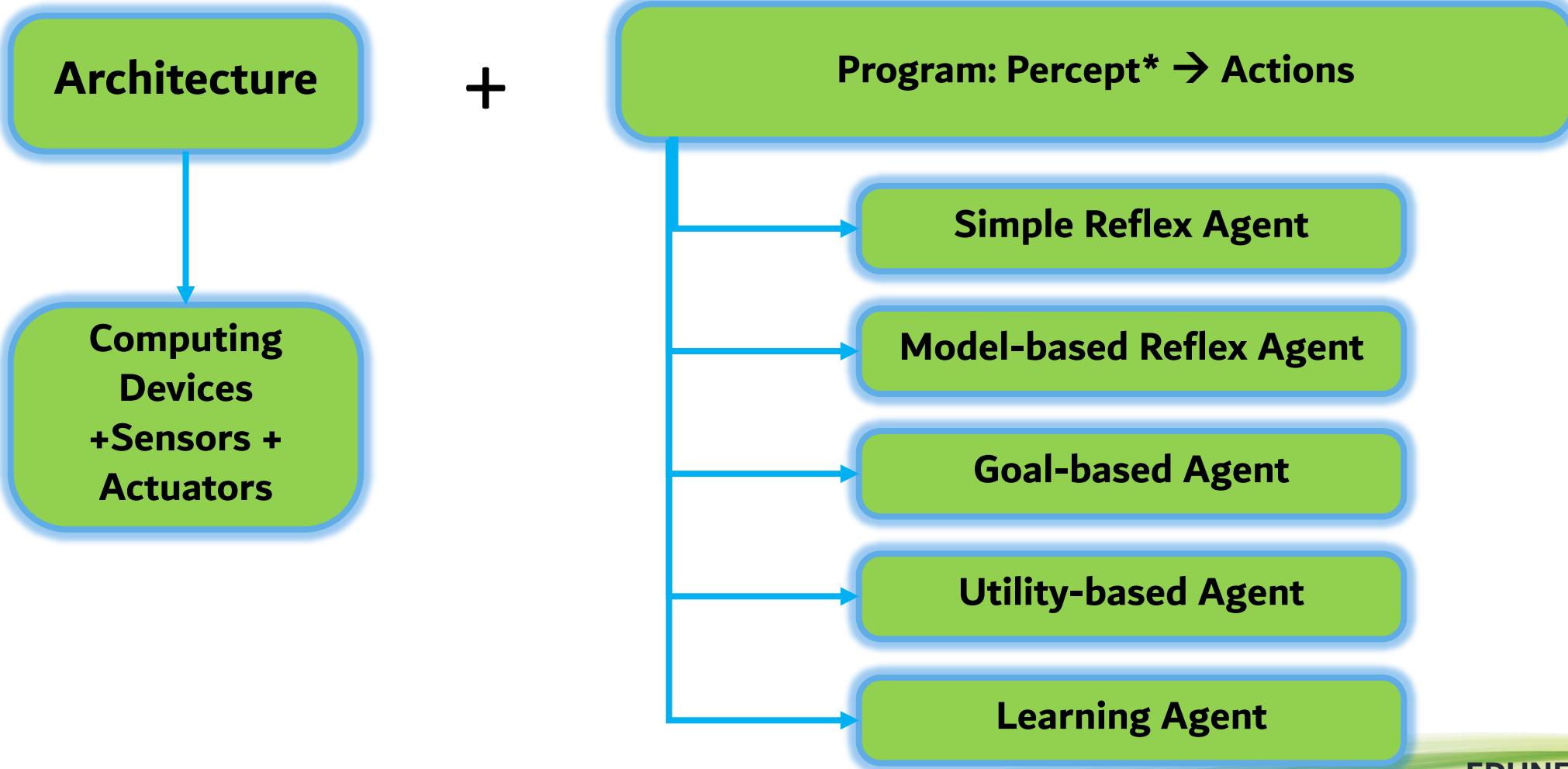
Agent Structure

Architecture

+

Program: Percept* → Actions

- Simple Reflex Agent
- Model-based Reflex Agent
- Goal-based Agent
- Utility-based Agent
- Learning Agent

Computing Devices +Sensors + Actuators

Modul : Intelligent Agent
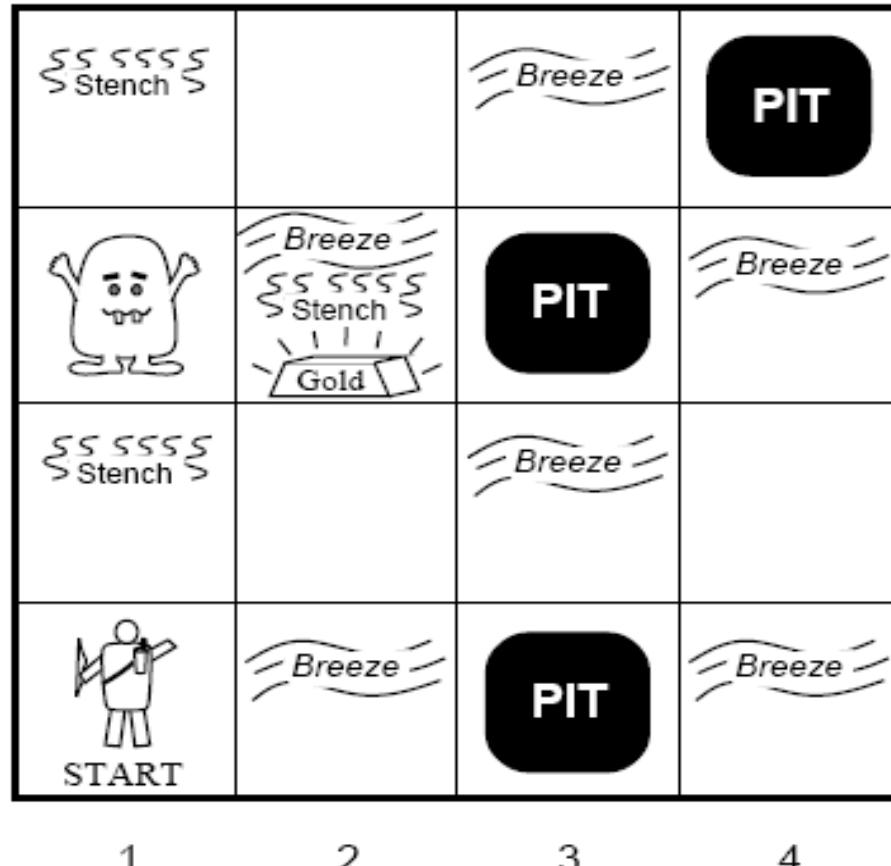
Agent Level

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Wumpus World

Performance Measure: gold +1000, death -1000, -1 per step, -10 for using the arrow
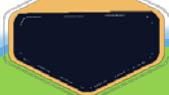
Environment: cave, rooms, Wumpus, gold

Actuators: motor to move Left, Right, Forward, hands to Grab, Release, and Shoot arrow
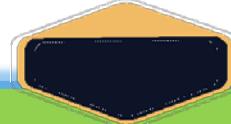
Sensors: sensor to capture [Stench, Breeze, Glitter, Bump, Scream]

EDUNEX ITB
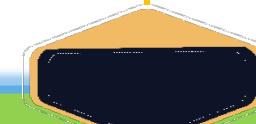
Level 1: Problem Solving Agent

Agent has information about all of the states in Wumpus World

Agent has to 'search', the path that can lead agent to the goal, as fast as possible
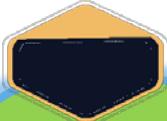
There are many searching algorithms, and each algorithm is suitable for certain problem

DFS, BFS, IDS, UCS
A*, Greedy Best First,
Minmax search,
Genetic Algorithm, Hill Climbing,
Simulated Annealing,
Etc...

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Level 2: Knowledge Based Agent

Agent doesn't have information about all of the states in Wumpus World. It only has 'basic knowledge/ premises'

When agent percept a state in a room, it will try to reason new facts/ states, this is how agent will step by step collecting all of the states of wumpus world in order to achieve its goal

Reasoning has to be done by Agent→ by deducting the premises with percepted fact.
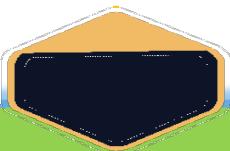
4	⎰⎰⎰⎰⎰ Stench ⎰		⎰ Breeze ⎰	PIT
3	👻	⎰ Breeze ⎰⎰⎰⎰⎰ Stench ⎰ ⎬⎬⎬ Gold ⎬	PIT	⎰ Breeze ⎰
2	⎰⎰⎰⎰⎰ Stench ⎰		⎰ Breeze ⎰	
1	START	⎰ Breeze ⎰	PIT	⎰ Breeze ⎰
	1	2	3	4
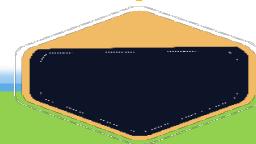
Level 3: Learning Agent
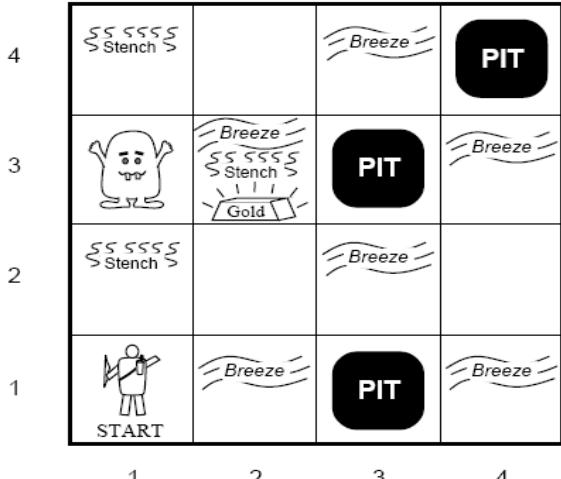
Agent doesn't have the information of all of the states and doesn't even have the basic knowldge of the wumpus world

Agent plays several times (perhaps dies several times) → The **observation data** from playing several times is the 'input' for learning process

The result of the learning process, agent will have basic knowledge, e.g. Squares adjacent to pit are breezy

There are many learning algorithms, that suitable for certain purposes, and the 'availability' of the data/ feedback
    Supervised learning
    Unsupervised learning
    Reinforcement learning

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THANK YOU