



Presentation of the Curricular Unit

Fundamentals of Artificial Intelligence

MSc in Applied Artificial Intelligence, 2023-24

Contents

- Artificial Intelligence
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Artificial Intelligence (AI)

- According to the Encyclopedia Britannica, Artificial Intelligence (AI) is the **ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.**
- Intelligence must include the ability to adapt to new circumstances.
- 24 Top AI Statistics And Trends In 2023:
<https://www.forbes.com/advisor/business/ai-statistics/>
- Articles about artificial intelligence:
<https://www.nytimes.com/spotlight/artificial-intelligence>



Retrieved on 2022.08.15 from <https://www.nytimes.com/spotlight/artificial-intelligence>

ARTIFICIAL INTELLIGENCE VS MACHINE LEARNING VS DEEP LEARNING

1 Artificial Intelligence

Development of smart systems and machines that can carry out tasks that typically require human intelligence

2 Machine Learning

Creates algorithms that can learn from data and make decisions based on patterns observed
Require human intervention when decision is incorrect

3 Deep Learning

Uses an artificial neural network to reach accurate conclusions without human intervention



Curricular unit goals

1. Understand and program intelligent agents that operate in different environments;
2. Formulate search problems and use appropriate search strategies and algorithms to solve these problems;
3. Use knowledge representation and reasoning to develop intelligent agents capable of solving complex problems, such as automatic planning;
4. Apply automatic learning techniques, both unsupervised and supervised, to learn from data.



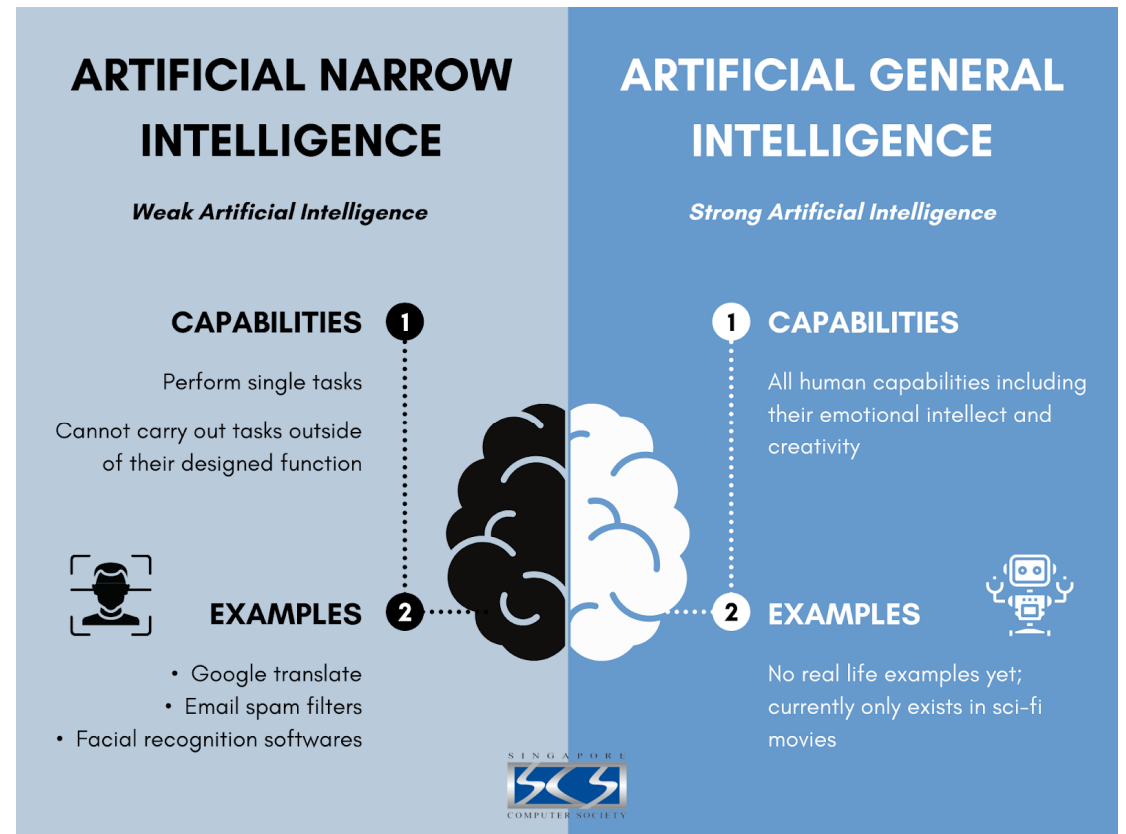
Syllabus (1)

1. Artificial intelligence

- Introduction
- Intelligent agents

2. Problem-solving

- Uniformed and informed search
- Search in complex environments
- Constraint satisfaction problems
- Adversarial search



Retrieved on 2022.08.13 from <https://www.scs.org.sg/articles/machine-learning-vs-deep-learning>

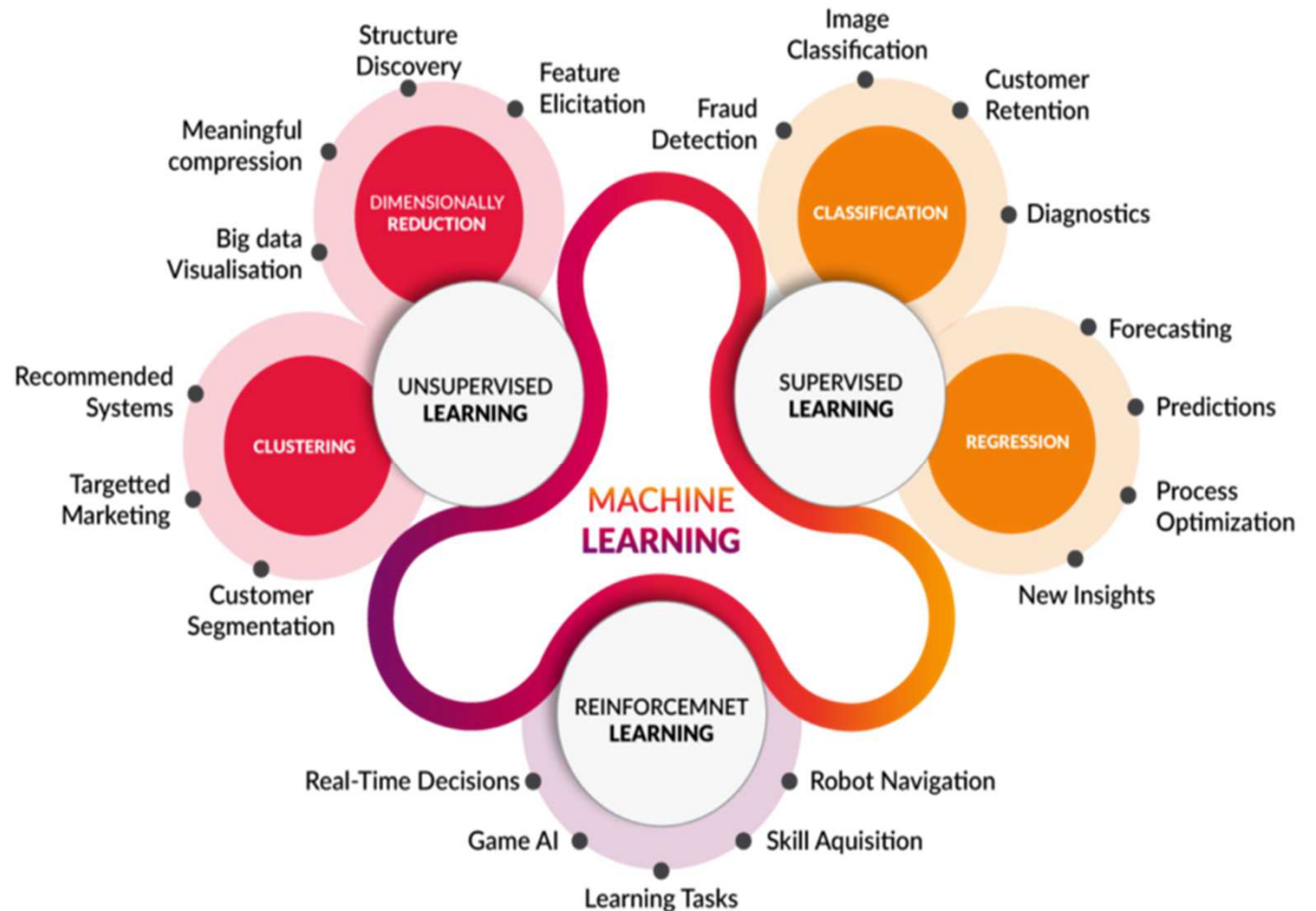
Syllabus (2)

3. Knowledge, reasoning, and planning

- Logical agents
- First-order logic
- Knowledge representation
- Automated planning

4. Machine Learning

- Learning from examples
- Supervised and unsupervised learning



Bibliography

Principal

- Norvig, P, Russell, S. (2021). **Artificial Intelligence: A Modern Approach**, 4th Edition. Pearson, ISBN-13: 978-1292401133

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- Raschka, S., Mirjalili, V. (2019). Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2, 3rd Edition. Packt Publishing. ISBN-13: 978-1789955750
- Wagstaff, R. (2013). Python In A Day: Learn The Basics, Learn It Quick, Start Coding Fast. CreateSpace Independent Publishing Platform, ISBN-13: 978-1490475578



Assessment methodology

- Components
 - Project 01, team of 2 elements
 - project 02, individual
- Final Grade (FG) calculation:
 - $FG = \text{Project01} * 50\% + \text{Project02} * 50\%$
- The assessment in the exam period consists of the submission of new projects followed by its presentation and defense.



Contacts and attendance hours

- Contacts:
 - Email: jpsilva@ipca.pt
 - Zoom: <https://videoconf-colibri.zoom.us/my/joaquimsilva>
 - Slack: <https://outclass23.slack.com/join/signup#/domain-signup>

- Office hours:
 - Monday: 16–17h00, Gab. 4
 - Monday: 19–22h00, Email/Zoom
 - Wednesday: 16–20h00, Gab. 4

- Please check Moodle platform
 - Assessment dates
 - Documentation
 - Exercises



Thank you!