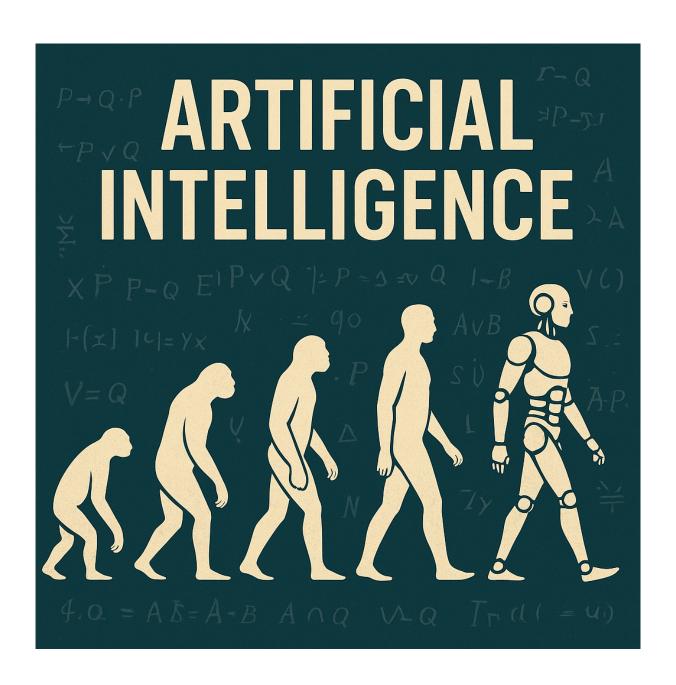# Marco Casu

Faculty of Information Engineering, Computer Science and Statistics
Department of Computer, Control and Management Engineering
Master's degree in Artificial Intelligence and Robotics

This document summarizes and presents the topics for the Artificial intelligence course for the Master's degree in Artificial Intelligence and Robotics at Sapienza University of Rome. The document is free for any use. If the reader notices any typos, they are kindly requested to report them to the author.

CONTENTS

1

INTRODUCTION

In this chapter we will introduce the basics of what is a machine learning problem, giving a mathematical definition. informally, with machine learning we define the use of knowledge (data) to improve the performance of a given program, using past experiences.

Generally, we use machine learning to solve problems with no deterministic solutions, trying to find an approximate one (such as recognizing what animal is represented in a given photo).

Usually, a machine learning problem consists in three main component:

- T : the given task

- P : a performance metric

- E : the past experiences (the data)

Let's see an example, we consider the game *Checkers*, and we want to model an agent that can play checkers.