universidade de aveiro

Milestone 1: Inception

ML/AI model evaluation platform

Plataforma de avaliação de modelos ML/AI

Course: "Projeto em Informática"
Supervisor: Prof. Mário Luís Pinto Antunes

2023-02-28

Team:

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Context

The need to process **large amounts of data** has been one of the main reasons for the mass development of intelligent systems.

Machine Learning (ML) algorithms are often applied to optimise **multiple real-life scenarios**, leading to cost saving and increased productivity.

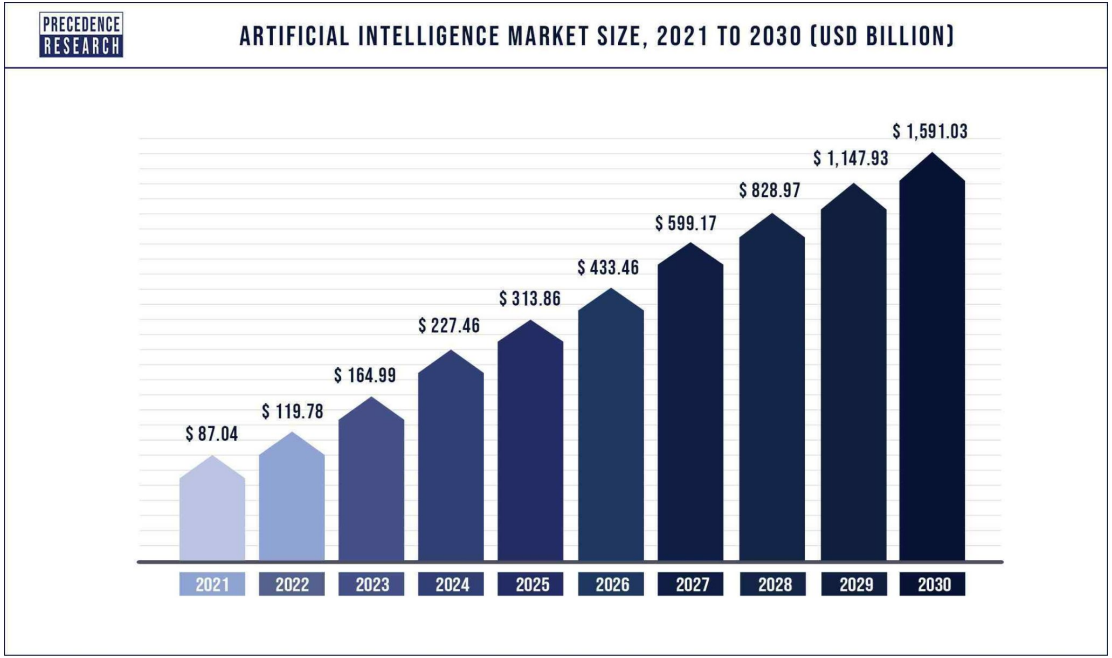
Advances in storage and processing technologies (e.g. cloud computing) have made it easier to collect, store and transform information.

ML/AI examples

ChatGPT

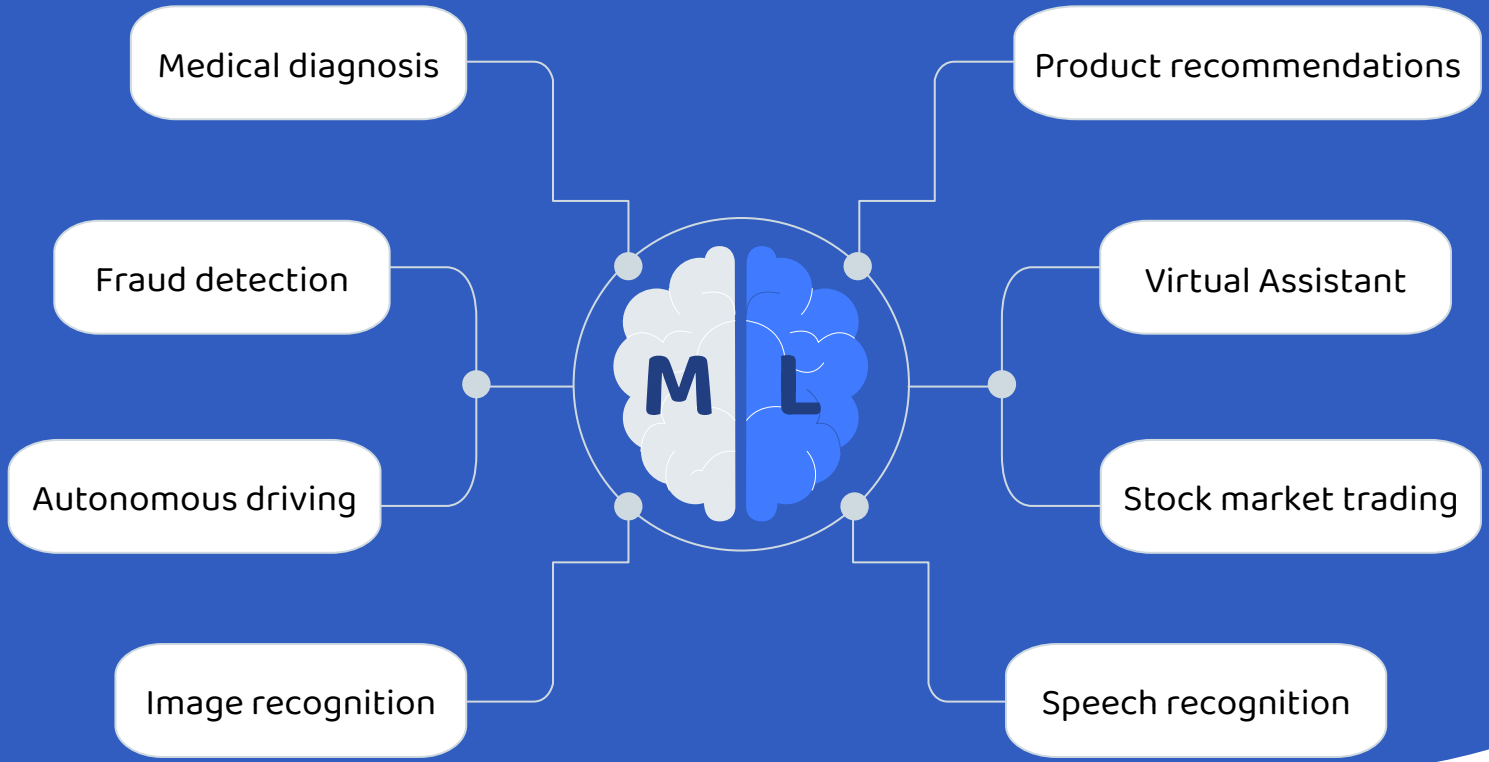
GitHub Copilot

Why is so important to promote a better ML/AI education?



Source: Precedence Research. (2023). *Artificial Intelligence (AI) Market* (Report No. 1635).

Applications of Machine Learning



Problems

Complexity of **evaluating** Machine Learning models

Teachers take a **long time** grading students work

Difficult tracking of students' **progress**

Students don't have a clear sense of **how good** their AI/ML models are

Main Goals

01

Develop a ML/AI model evaluation platform

02

Enhance the ML and AI learning process

- Make the learning and teaching process more interactive, visually appealing, and dynamic
- Help students improve their ML knowledge, specially develop good machine learning models
- Help teachers improve the ML teaching process
- Motivate and prepare students for future challenges that require ML/AI techniques

Expected Results

Integration with UA IdP

Authentication method using UA IdP since target audience are UA people

Grouping Students

Teachers should be able to create, modify and delete classes.

Exercices creation

Teachers can upload datasets and create exercises with limited attempts, deadlines and specific evaluation methods.

Students engagement

Students may access proposed exercices and submit a solution to them and compare results with other students.

SWOT Analysis

Strengths, Weaknesses, Opportunities and Threats

	Helpful	Harmful
Internal Origin	**Strengths** Better experience with ML learning	**Weaknesses** Poor engagement Requirements might change
External Origin	**Opportunities** Increase popularity of ML/AI	**Threats** Students' willingness to cheat Depends on external IdP

Main Tasks

Build front-end interface

(2 people)

Build back-end ML evaluation model

(2 people)

Talk to domain experts

Prototyping and usability tests

Talk to STIC admins in order to integrate UA IdP onto our platform.

(1 person)

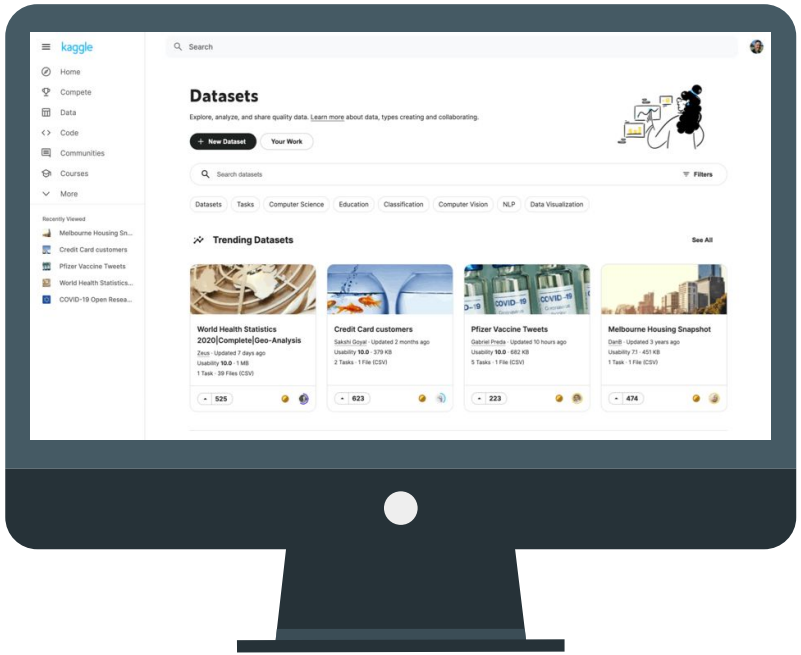
Project Schedule

ID	TITLE	INCEPTION		ELABORATION		CONSTRUCTION										TRANSITION		
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17
1	Begining																	
1.1	Requirement and objectives meetings																	
1.2	Risk analysis																	
1.3	Cost and benifit analysis																	
1.4	Start Management with Jira																	
1.5	Create GitHub Organization																	
1.6	Plan Project Calendar																	
1.7	Communication plan (project website)																	
1.8	Define Team Roles																	
1.9	Schedule Weekly meetings																	
2	Prepare Presentation of the lifecycle objectives and calendar																	
M	**M1: presentation of the lifecycle objectives and calendar for the project**																	
3	Define System Architecture																	
4	Requirement analysis																	
4.1	Requirements Gathering																	
4.2	Talk to domain experts																	
4.3	Categorize requirements																	
4.4	Study analogous systems																	
4.5	Use cases																	
4.6	Personas																	
4.7	Scenarios																	
4.8	User Stories																	
4.9	Prepare presentation of the lifecycle architecture																	
M	**M2: presentation of the lifecycle architecture; the milestone is achieved when the architecture has been validated.**																	
5	Prototype																	
5.1	Develop Prototype																	
5.2	Test Developed Prototype																	
5.3	Improve Prototype																	
6	Prepare Prototype Presentation																	
M	**M3: prototype; mid-term presentation with supervisors; peer evaluation.**																	
7	Development																	
7.1	Associate User Stories with tasks																	
7.2	Define API Endpoints																	
7.3	Develop frontend																	
7.4	Develop backend																	
7.5	UA IDP integration																	
8	Testing																	
8.1	Unit Tests																	
8.2	Integration Tests																	
8.3	Usability tests																	
8.4	Feedback Analysis																	
8.5	Test Review (QA)																	
9	Write Documentation																	
10	Demo + Poster																	
11	Project video																	
12	Write Technical Report																	
13	Prepare Project Presentation																	
M	**M4: project presentation; all functionality has been developed!**																	
14	Students@DETI																	

See Project Schedule

W1: 14/02 - 21/02 **W2**: 21/02 - 28/02 **W3**: 28/02 - 07/03 **W4**: 07/03 - 14/03 **W5**: 14/03 - 21/03 **W6**: 21/03 - 28/03
W7: 28/03 - 04/04 **W8**: 04/04 - 11/04 **W9**: 11/04 - 18/04 **W10**: 18/04 - 25/04 **W11**: 25/04 - 02/05 **W12**: 02/05- 09/05
W13: 09/05 - 16/05 **W14**: 16/05 - 23/05 **W15**: 23/05 - 30/05 **W16**: 30/05 - 06/06 **W17**: 06/06 - Students@DETI

Related work



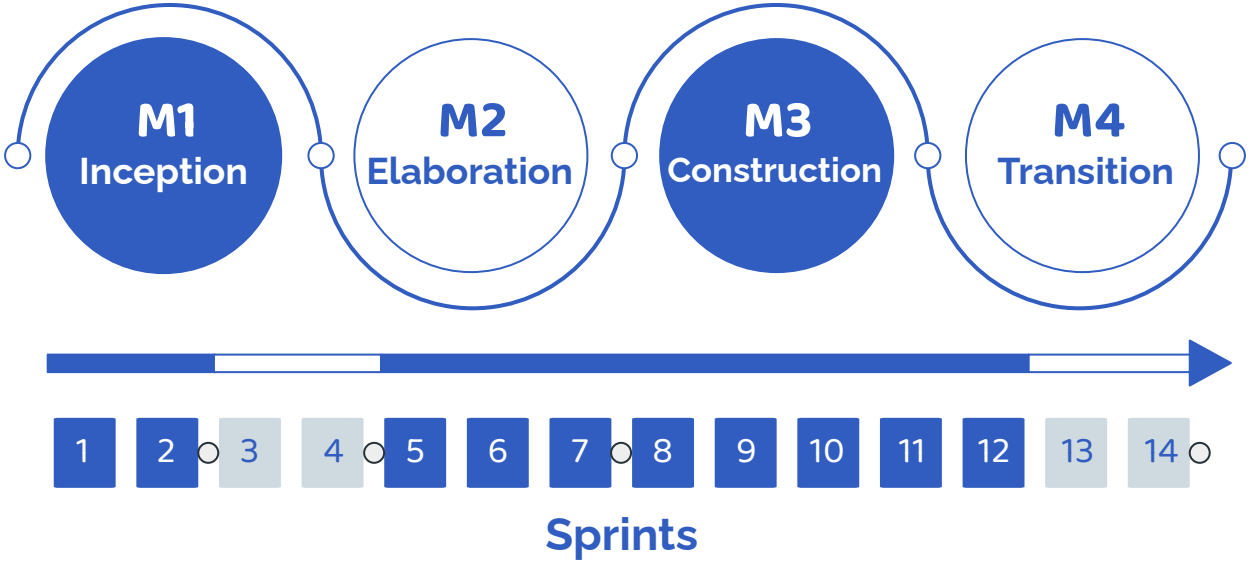
kaggle™

What is it?

Why don't we just use it?

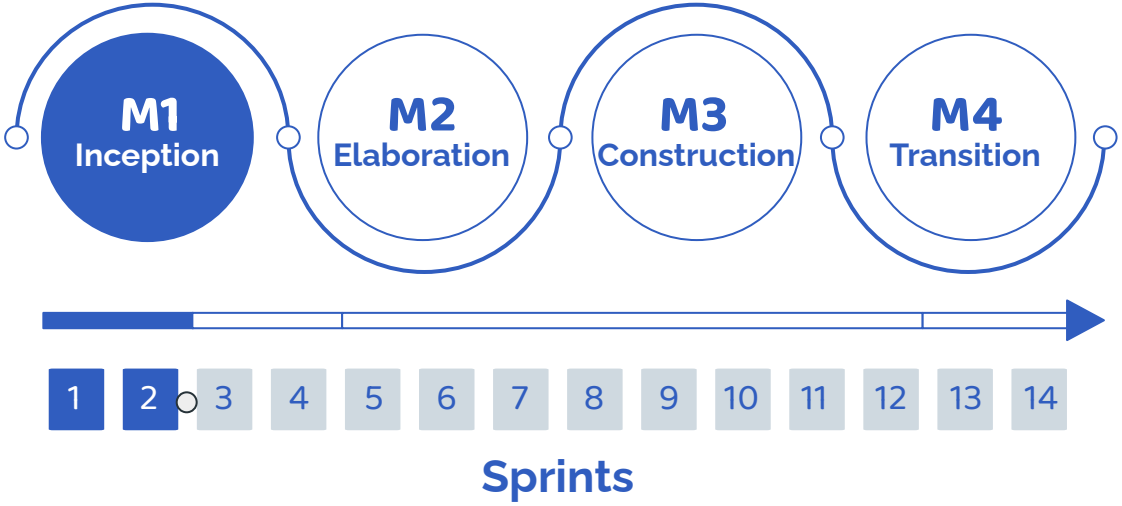
Calendar

Our approach will be **iterative** and **incremental** (OpenUP).



○ **M**ilestones

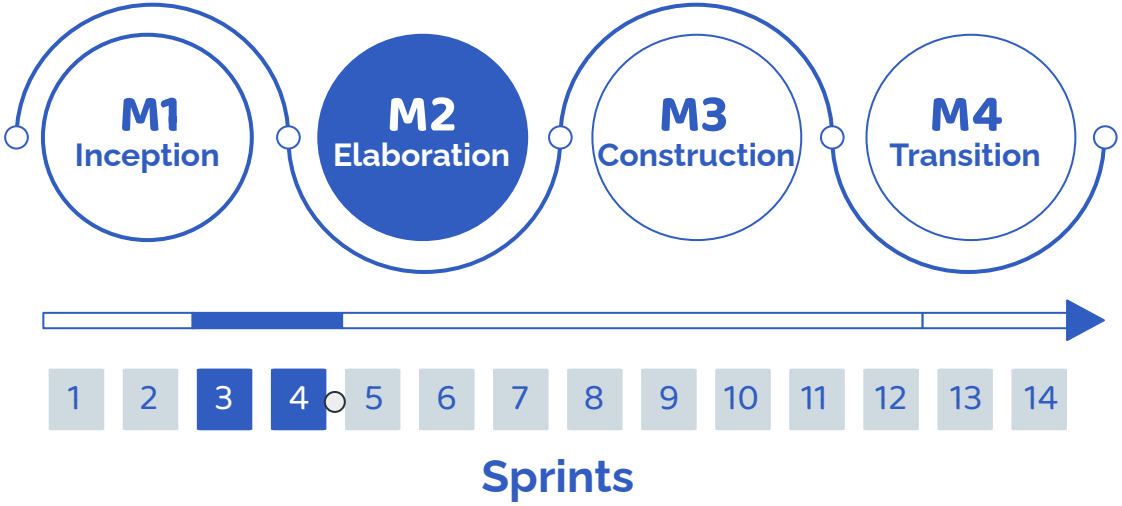
Inception



- Vision
- Key features
- Calendar
- Goals
- Risks

14/Feb - 28/Feb

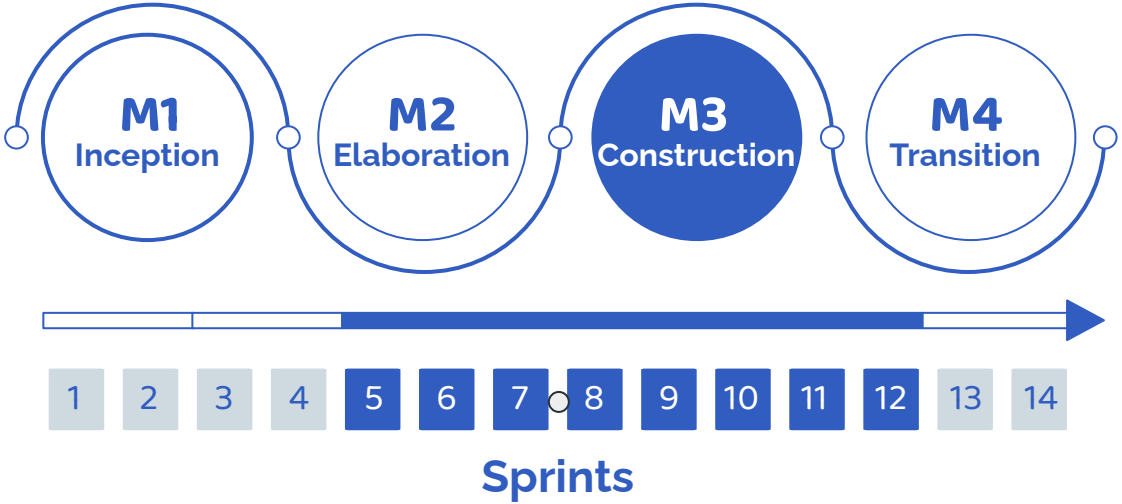
Elaboration



- Requirements enhancement
- Architecture
- Risks mitigation

28/Feb - 14/Mar

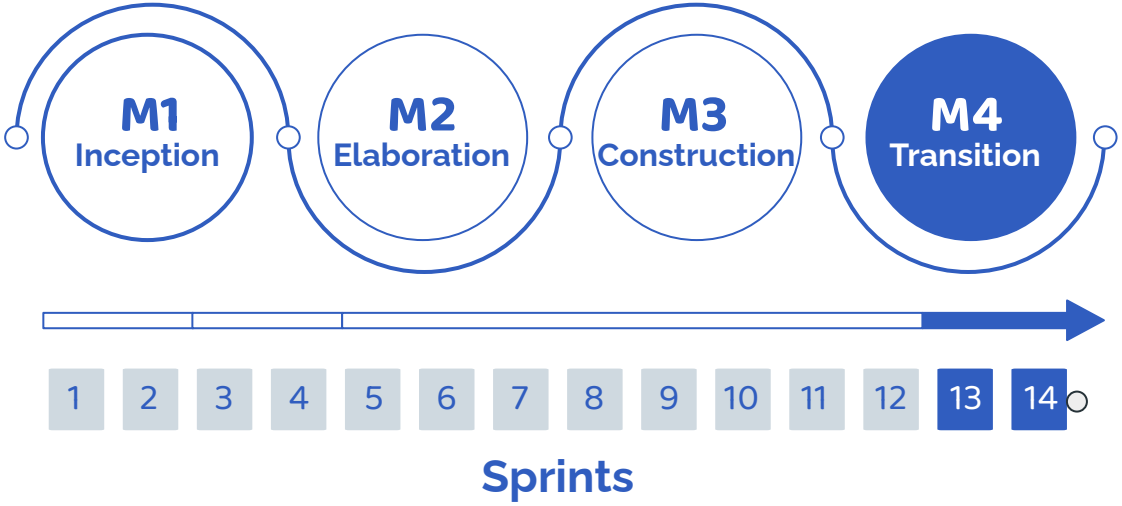
Construction



- Prototype
- Product development
- Usability tests
- Feedback analysis

14/Mar - 9/May

Transition



- Deployment
- Minor adjustments
- Product developed
- Documentation

9/May - students@DETI

Communication plan

Weekly face-to-face meeting

Access our website with important deliverables

Slack group with supervisor

Atlassian Jira

GitHub

Team roles

Leonardo Almeida

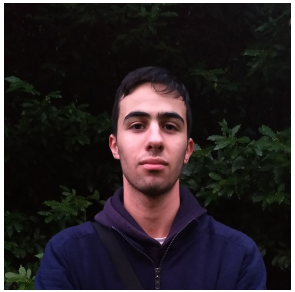
Team Manager
Front-end developer

Rafael Gonçalves

Product Owner
Back-end developer

Pedro Rodrigues

Architect
Front-end developer



Emanuel Marques

DevOps Master
Back-end developer

Diogo Magalhães

QA Tester
Developer (IdP)

Resources

- https://www.projectsmart.co.uk/project-planning/project-planning-step-by-step.php
- https://www.precedenceresearch.com/artificial-intelligence-market
- https://slidesgo.com/theme/retato-slideshow#position-38&results-1357
- https://storyset.com
- https://www.utm.mx/~caff/doc/OpenUPWeb/index.htm
- https://scagile.io/en/blog/scrum-sprint-length/
- https://en.wikipedia.org/wiki/SWOT_analysis
- https://www.kaggle.com
- https://openai.com/blog/chatgpt/
- https://github.com/features/copilot
- https://www.gantt.com/

Relevant paper:

Alex Serban, Koen van der Blom, Holger Hoos, and Joost Visser. 2020. **Adoption and Effects of Software Engineering Best Practices in Machine Learning**. In *Proceedings of the 14th ACM / IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM)*, ACM . DOI:https://doi.org/10.1145/3382494.3410681

AI research has much to improve, hence the need for our platform.