AI Project

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Aims and objectives of this class

- Implementing high-tech projects in the fields of artificial intelligence, machine learning, computer vision, natural language processing and others
- Using modern high-end hardware, such as GPU clusters and cloud services
- Utilizing an agile process framework such as Scrum
- Understanding and using modern industrial software development tools such as work package trackers, code revision systems, debuggers, profilers and others
- Presenting R&D outcomes to stakeholders at different levels, such as fellow students, faculty members and practitioners, executives

Prerequisites

- Artificial intelligence
- Programming
- (Some) mathematics
- Ask for help in class!

Scrum

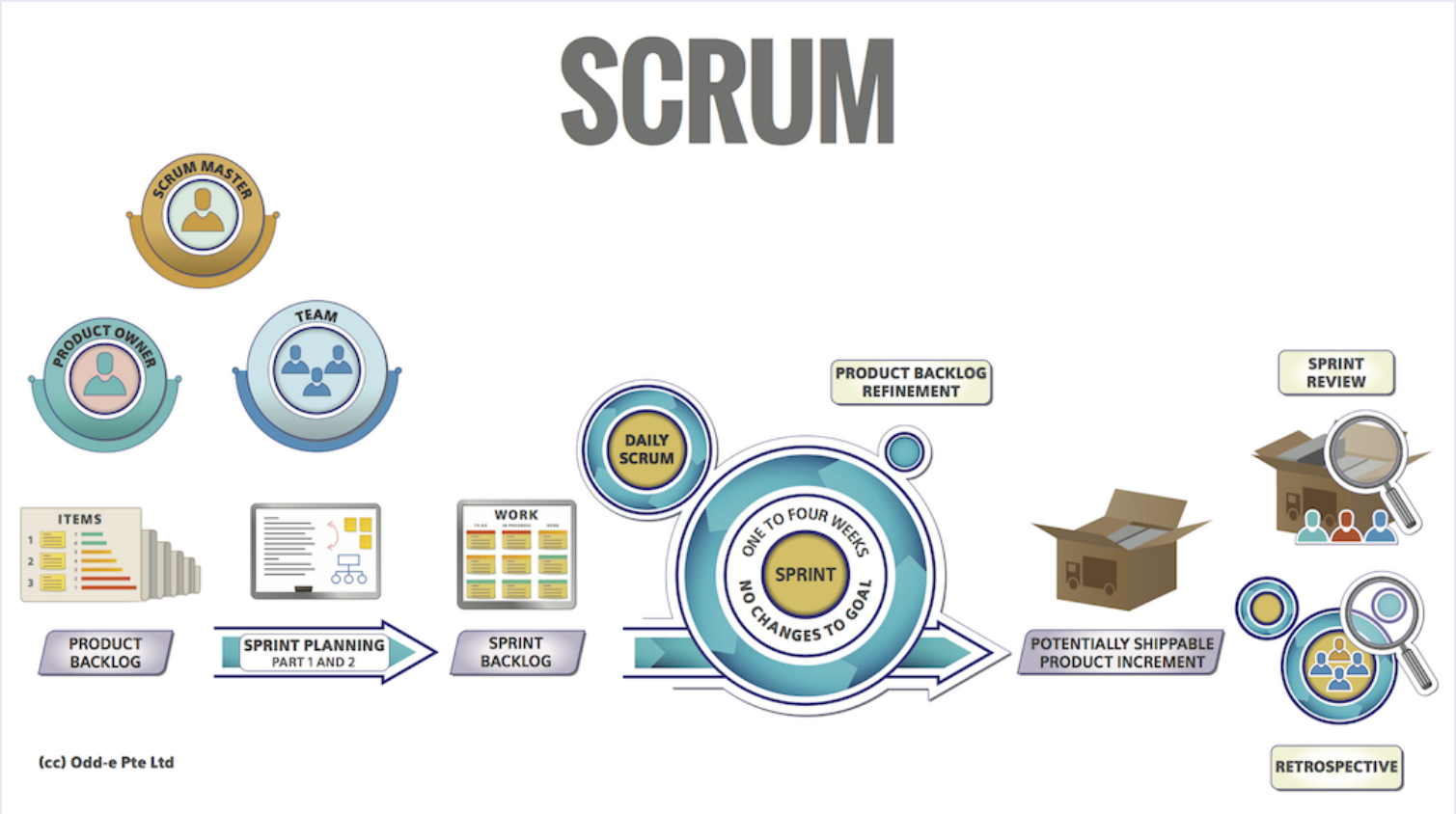

Figure: Scrum stakeholders, artifacts and sprints[a].

[a] Source: `http://github.com/jvandemo/github-scrum-workflow`

Background

How do you handle the following tasks?

- Keeping track of your code changes
- Reverting changes
- Working with others on the same code
- Independently developing multiple features

Revision control

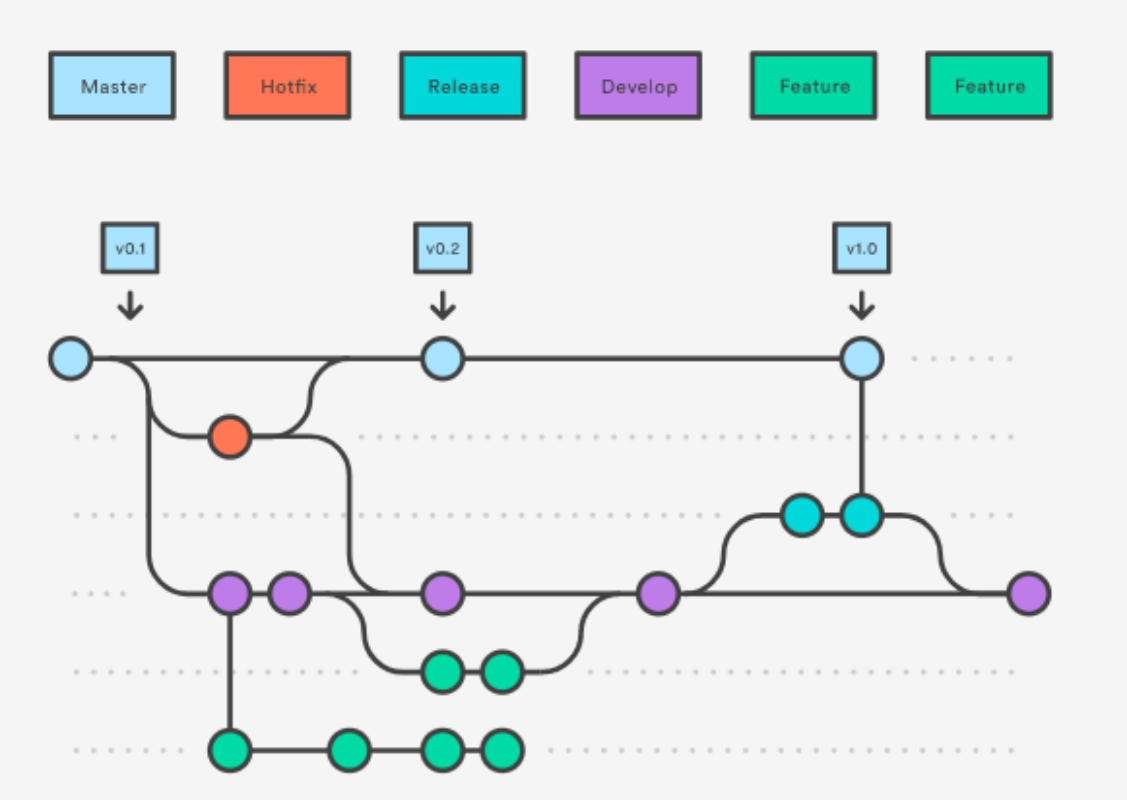

Figure: Branches[a].

[a] Source: http://hackernoon.com/how-we-transitioned-from-traditional-agile-to-agile-ci-cd-2ef9b7af5bf0

Background

Popular source code revision control systems

- Git
- Mercurial
- Subversion
- ...

Github

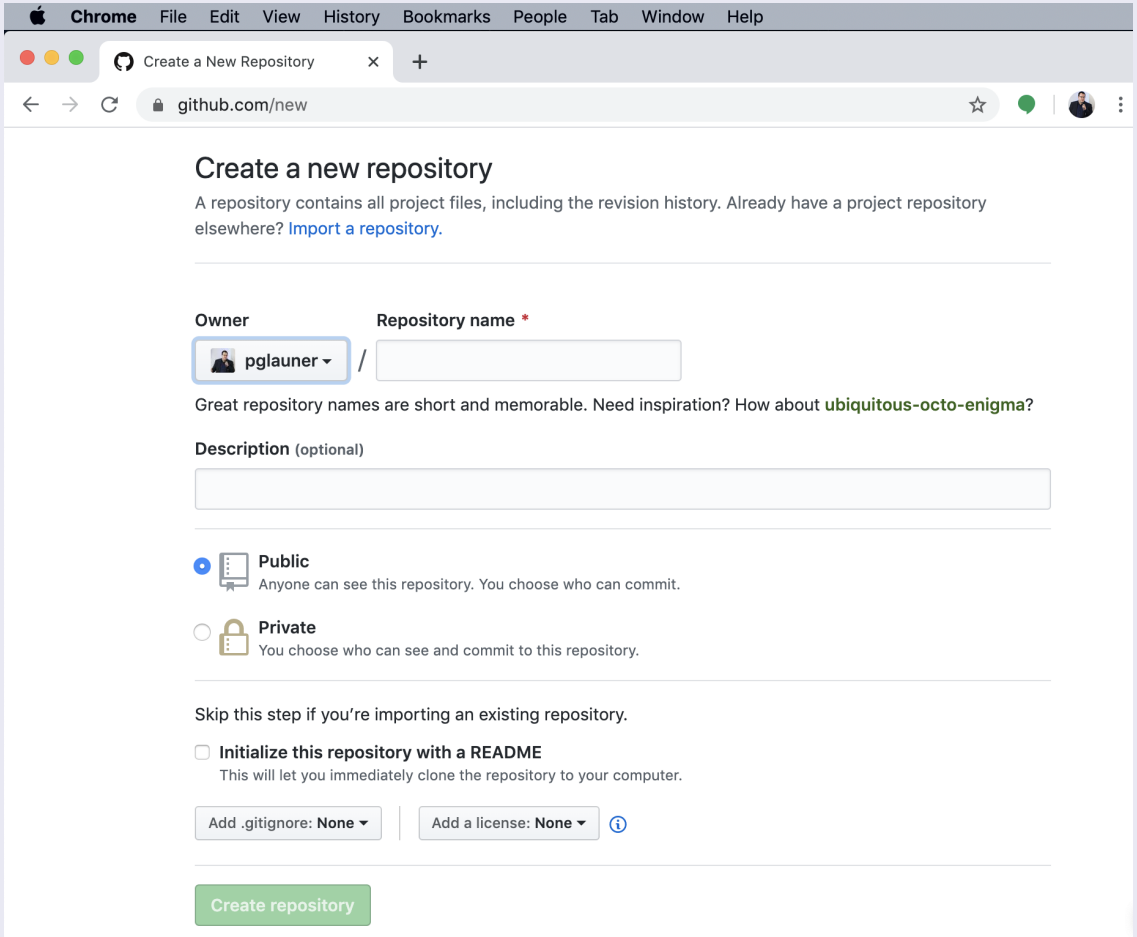

Figure: Github.

Github

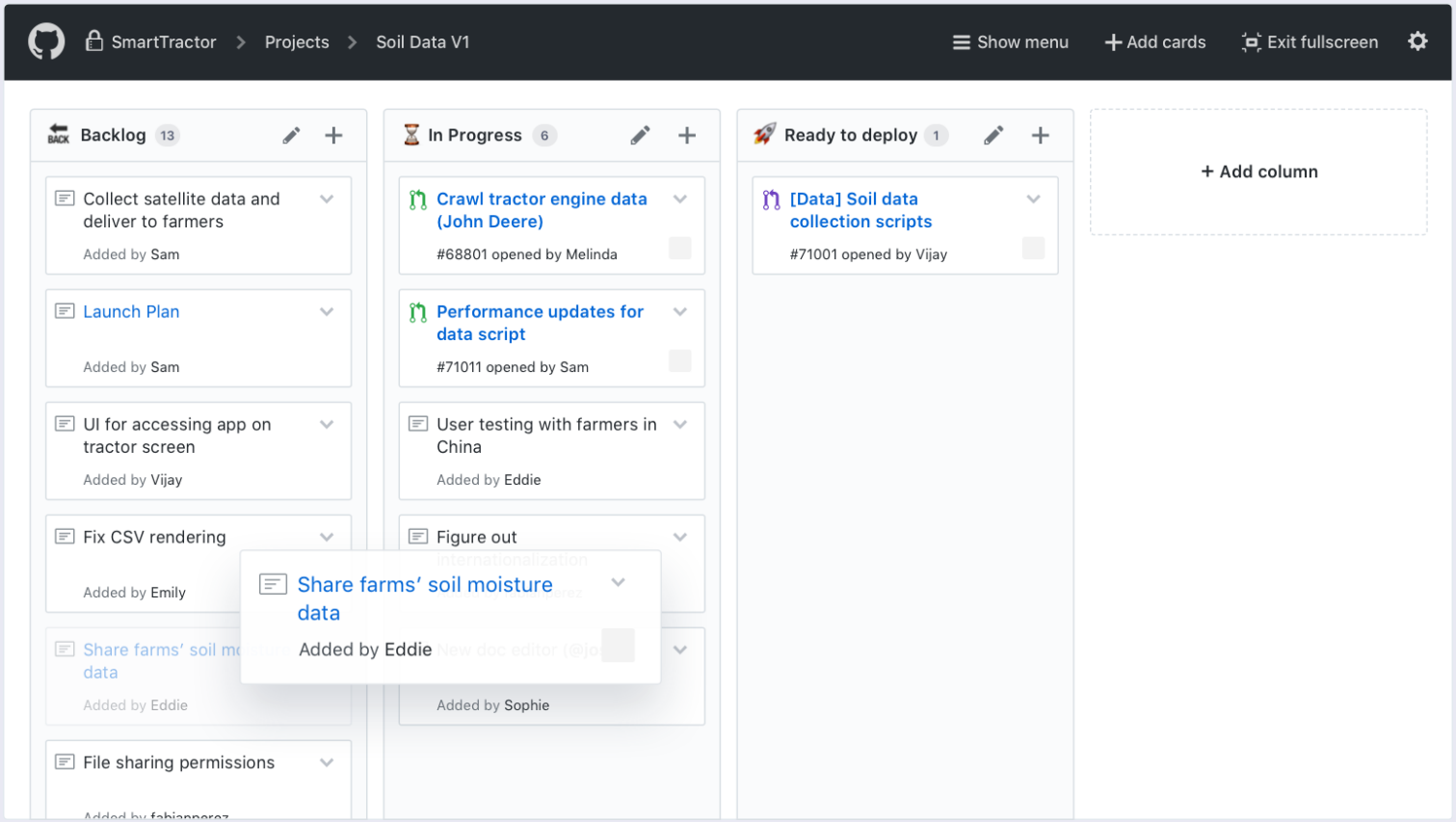

Figure: Scrum stakeholders, artifacts and sprints[a].

[a] Source: `http://github.com/features/project-management/`

Introduction

Goal

Everyone will work together on one large group project.

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Home 4.0 (DeinHaus 4.0) (1)

More information: `http://www.deinhaus4-0.de/start/`.

Home 4.0 (DeinHaus 4.0) (2)

DeinHaus 4.0
LÄNGER LEBEN ZUHAUSE
NIEDERBAYERN

Start Projekt Mustereinrichtungen Mediathek Newsletter Häufige Fragen
Kontakt

Aktuelle Informationen zu Covid-19

Ihre Gesundheit liegt uns am Herzen. Daher werden aufgrund der Covid-19 Lage im Landkreis aktuell keine Führungen durch unsere Mustereinrichtungen angeboten.

Wir bitten um Ihr Verständnis.

Benötigen Sie Unterstützung in der aktuellen Situation?
Unter
www.unser.soziales.bayern.de
finden Sie relevante Informationen und Hilfsangebote in Ihrer Nähe.

UNSER SOZIALES BAYERN
Wir helfen zusammen!

Das Team von DeinHaus 4.0 wünscht Ihnen beste Gesundheit!

Home 4.0 (DeinHaus 4.0) (3)

Musterhaus Wolf

Osterhofen

Am Stadtwald 20, 94486 Osterhofen

Aktuell sind **keine** Besichtigungen möglich.

Musterwohnung Erl

Deggendorf

Oberer Stadtplatz 18, 94469 Deggendorf

Aktuell sind **keine** Besichtigungen möglich.

Introduction

Possible use cases

- Detect high blood pressure
- Detect overweight
- Detect cardiovascular diseases
- Detect lack of sleep
- Investigate data quality and do data cleansing
- ...

Organization

Workload:

- 1.5 hours (90 minutes) of laboratory sessions per week
- 5 ECTS
- Equivalent to 150 hours
- A term takes 15 weeks
- This makes approximately **another 8.5 hours per week** for working on your project, doing background readings, preparing presentations, etc.

Next steps

Schedule (1)

This week:

- Kickoff (with Home 4.0)
- Choose a product owner.
- Choose a scrum master (who should also contribute to the implementation).

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Next steps

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Next week:

- More details, Q&A (with Home 4.0)

In two weeks:

- Review and present the state of the art of modern home care using AI
- Access data and do initial exploratory data analysis (EDA) (with Home 4.0).
- Present your roadmap for the remainder of the term (with Home 4.0).
- ...

Next steps

Schedule (2)

Next:

- Start your first iteration (do at least two iterations!)
- We will have a weekly Scrum meeting in which you summarize what has happened in the previous 7 days.
- We will discuss any open questions, issues, impediments, etc.

Examination

Score

Category	Maximum
Review of related work	10
Methodology and results	15
Initiative and continuity	15
Professional software development approach	10
Total	50

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Note

All members of a team are supposed to get the same mark. Those who do not commit to the project may get a different mark though.

Examination

Mark (1)

Your temporary mark is computed as follows:

$$\text{Temporary Mark} = \frac{60 - \text{Score}}{10}.$$

Examination

Mark (2)

Score	Temporary Mark	Final Mark
50	1.0	1.0
49	1.1	1.0
48	1.2	1.0
47	1.3	1.3
46	1.4	1.3
45	1.5	1.3
44	1.6	1.3
43	1.7	1.7
42	1.8	1.7
41	1.9	1.7

Examination

Mark (3)

Score	Temporary Mark	Final Mark
40	2.0	2.0
39	2.1	2.0
38	2.2	2.0
37	2.3	2.3
...	...	...
21	3.9	3.7
20	4.0	4.0
0-19	-	5.0^{f}

Legend:
^{f}: Fail.

References

You may find the following books helpful:

- S. Chacon and B. Straub, "**Pro Git**", Apress, second edition, 2014.
- I. Goodfellow, Y. Bengio and A. Courville, "**Deep Learning**", MIT Press, 2016.
- C. Larman, "**Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development**", Prentice Hall, 3rd edition, 2004.

Final slide

- Comments, suggestions, etc.?
- Fingers crossed for your project.
- Contact me by email if you have any questions.