

Hands-on Machine Learning

What do people talk about on Reddit?

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- Hands-on Practice!
- Recap and What's Next

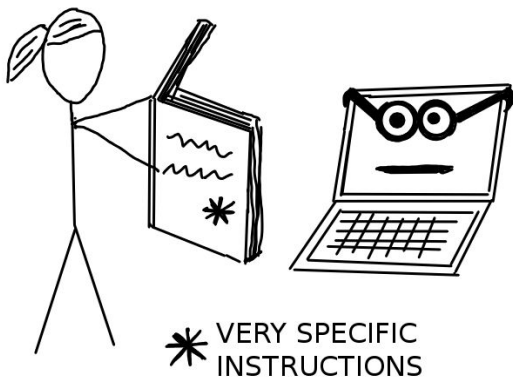
Introduction

- What is Machine Learning?
- An Example
- Description of the Reddit Project

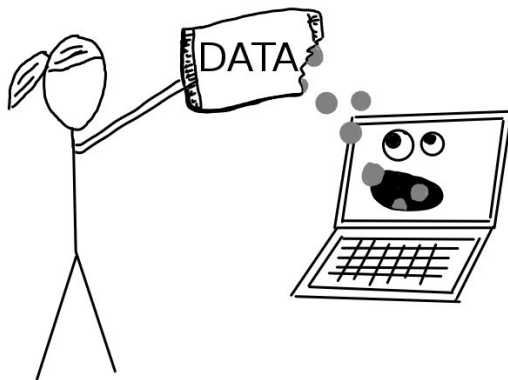
What is Machine Learning?

Machine learning (ML) is the study of computer algorithms that improve automatically through experience (Wikipedia)

Without Machine Learning

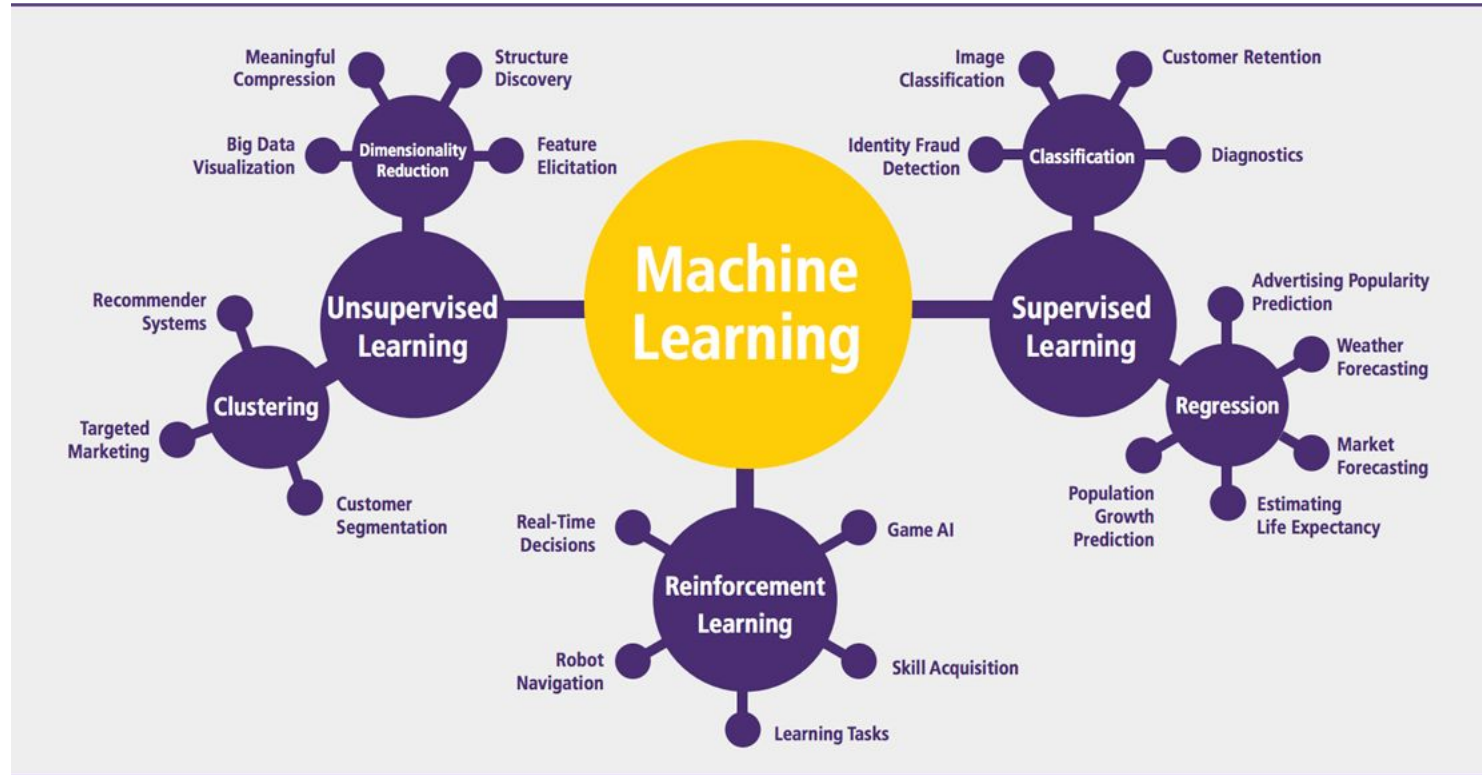


With Machine Learning

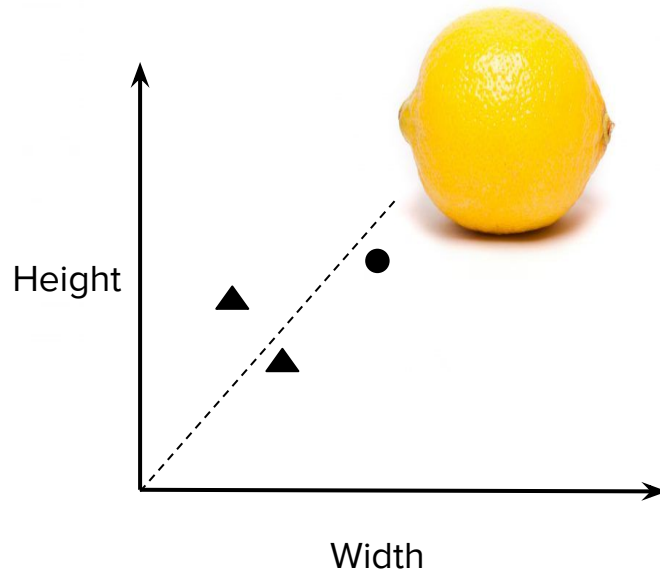
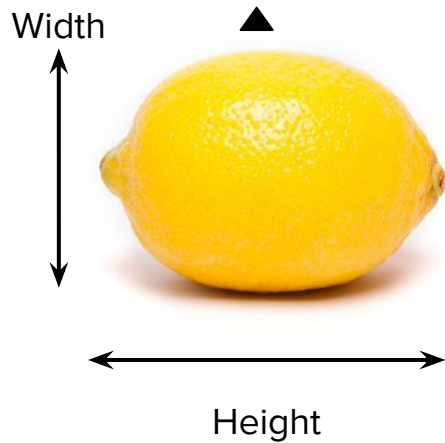
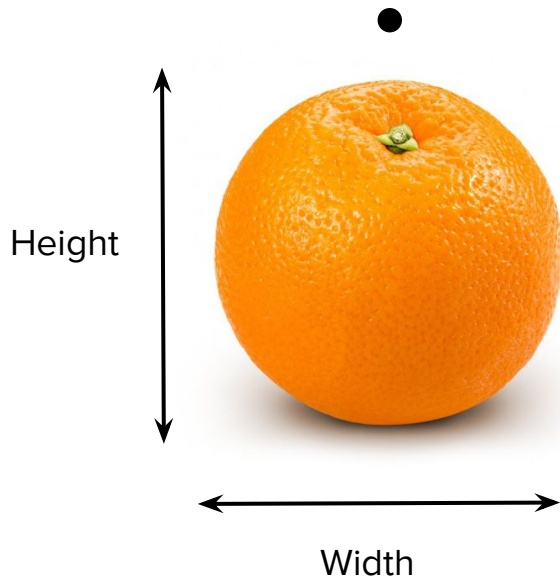


Credit: <https://christophm.github.io/interpretable-ml-book/terminology.html>

What is Machine Learning?



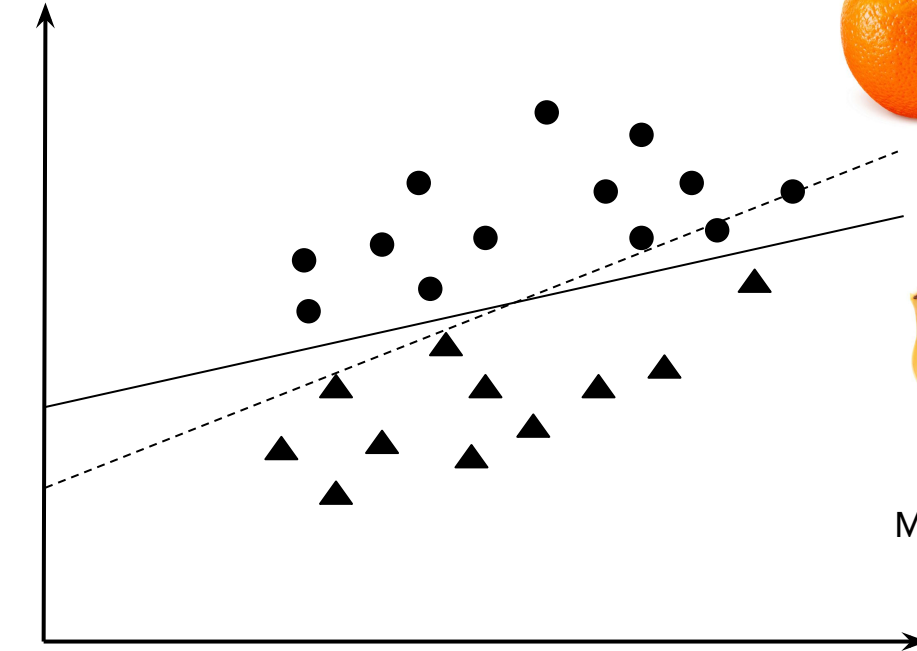
Example: Orange and Lemons



Oranges and Lemons



Width



Model Breaks Down!
Assumptions are
important

Height

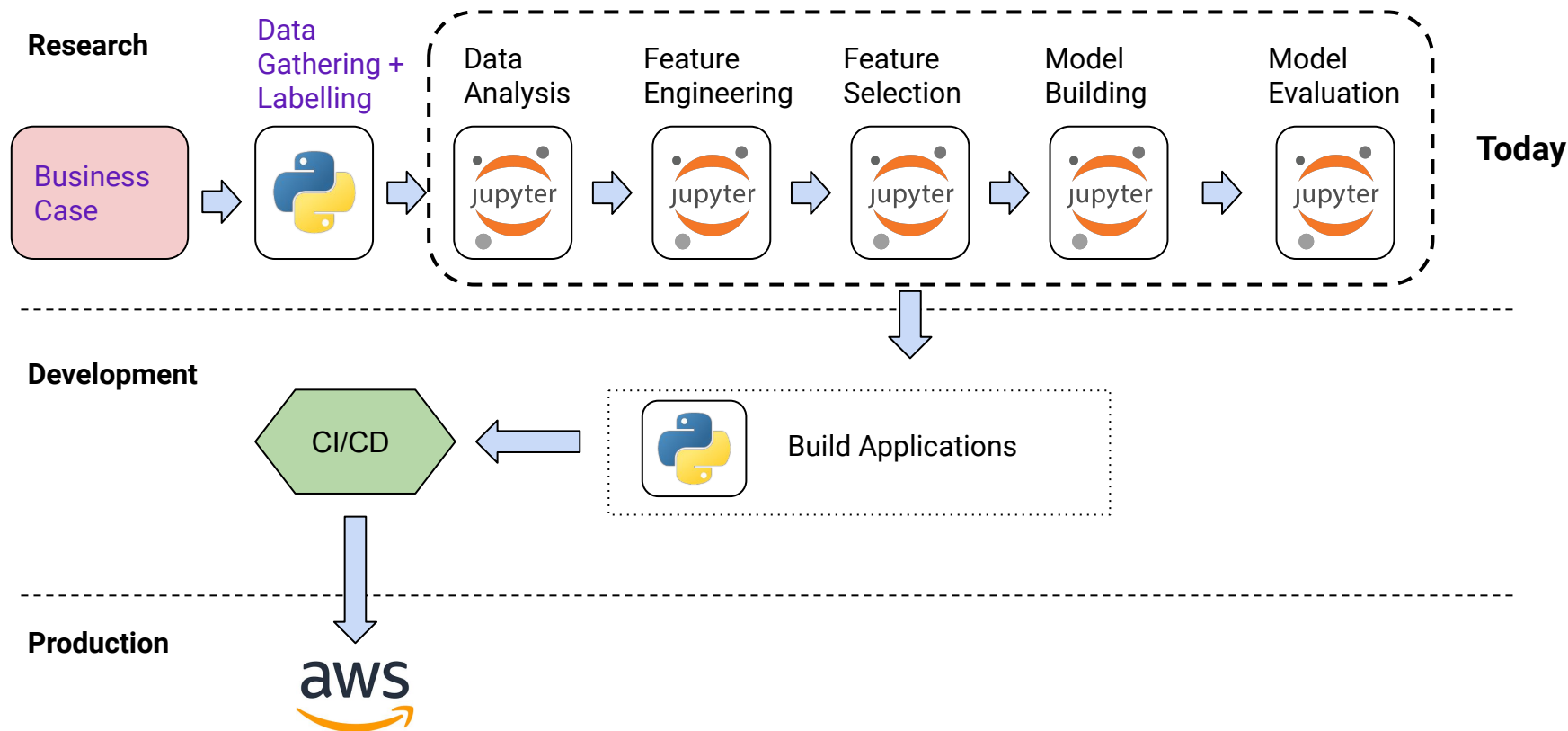
Reddit Project

- We look at a highly active subreddit [r/usertesting/](#) where panelists come to talk about their experiences
- The comments can be used to gauge sentiments and reactions to features
- What are the most common topics during a given period of time?
- Can we track this automatically?

Why is this a problem suitable for ML?

- Easy to collect data - great Python libraries for the Reddit API
- Can be framed as a supervised classification problem
- Finite number of topics to label
- Actionable - e.g. anomalously high number of threads about poorly designed tests in a week can lead us to investigate the particular accounts

Stages of a Machine Learning Project



Gathering Data

- Download Reddit comments using [praw](#)
- Manual labelling of 700 post topics
- Labelling is hard work! We had to rely on our own judgements - need to consult domain experts

Labels

Name	Description
Bad Test	Problems with a specific test (e.g. badly designed, too long, unreasonable expectations)
Bug	Issues with the dashboard
Live Convo	Problems / questions regarding Live Conversation Tests
Mobile	Problems / questions regarding taking tests on mobile apps
No Test	No available tests to take
Payment	Problems receiving payments
Ratings	Questions / problems / rants relating to received ratings
Recorder	Problems with recording video or audio or with uploading
Screeners	Problems / rants relating to screeners (too many questions, failing to pass, repetitive screeners)
Other	E.g. UT conspiracy theories, random chit-chat, bragging about tests completed.
Other company	Discussions about other testing companies / direct recruitments

Comparing the first 100 labels between 3 labellers gives an inter-labeller agreement of ~ 0.75

Labelling

It happened again! An absolute joke. Twice this evening on two mobile tests firstly both disappeared from my face citing session is no longer available. A few minutes later magically the Accept button shows up and look it's the test whose screeners I qualified for has changed it's mind and is back with me to ask for feedback. Secondly neither of the prototypes websites worked it simply loaded a blank page in the background. One of the two had recorded 17 minutes of my feedback. Reported both tests and surprise surprise got nothing under my activities or in my email confirming a Zendesk ticket was registered I believe the recordings are temporarily saved on our devices and get erased once we upload a test or report a problem so no means to go back to it and trace the test ID. Loving this roller coaster of a ride. An absolute joke


Labeller 1: No Test

Labeller 2: Bad Test

Labeller 3: Mobile

Label: Mobile

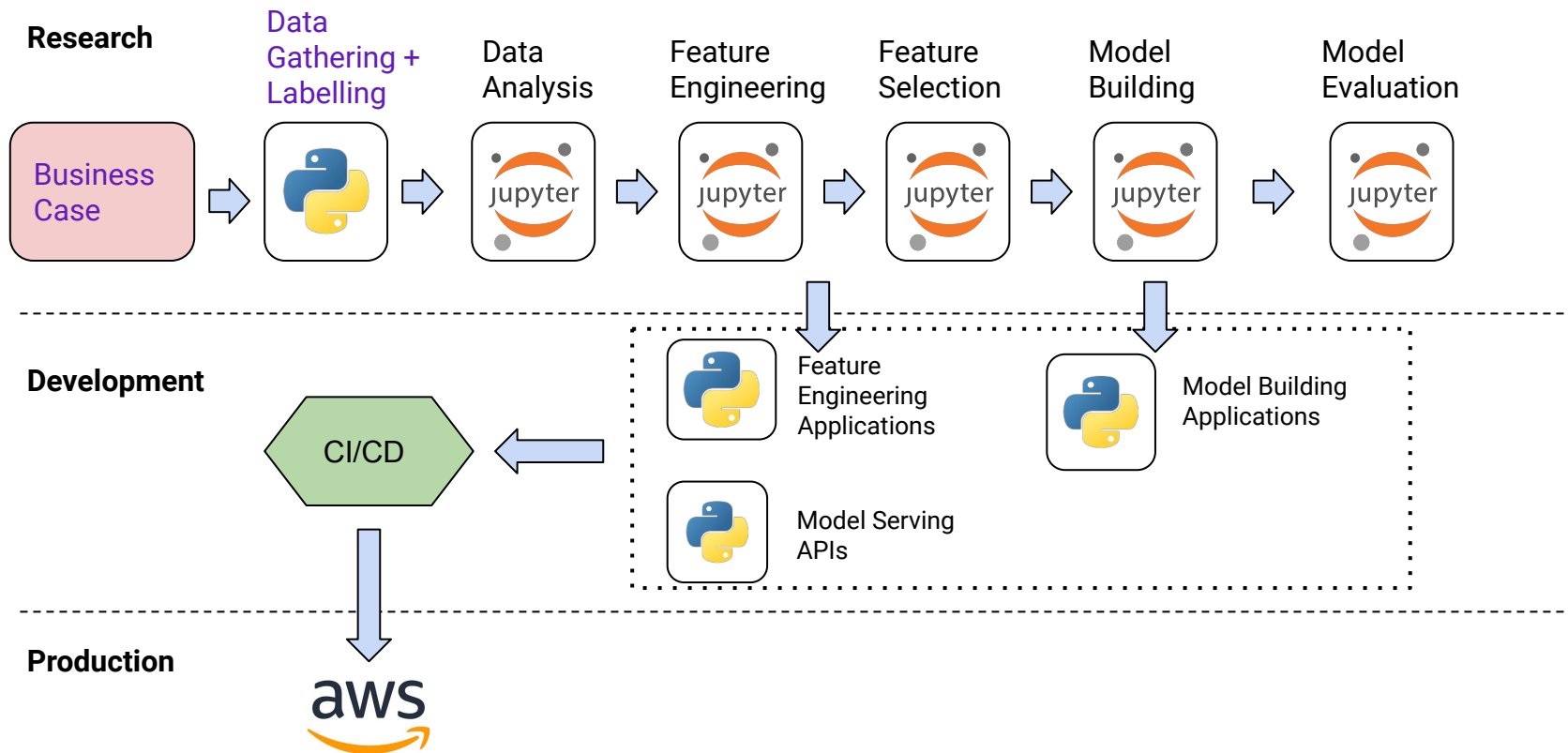
Hands-on ML Experience

- Navigate to Github Repo
<https://github.com/yusueliu/reddit>
- Click on  launch binder to launch notebooks on Binder

Better Model

- More high quality data
- More complex models (e.g. neural networks)
- Word/Sentence Embeddings (use semantic information about texts from pretrained models)

What happens next



Deployment

- Production code → Deploy → Integrate with System (involves MLEs, Data Engineers, Software engineers)
- Continuous Monitoring (Watch out for model degradation)