Machine Learning

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Learning outcome

After this session you will be able to:

- Describe the main intuitions behind Machine Learning
- Discuss and illustrate possible real applications of Machine Learning in a high-level manner

Activity

- You have 5 minutes to come up with a definition for "Machine Learning" (You can use Google if you've never ever heard about it)

What is Machine Learning?

- "Machine Learning, field of study that gives computers the ability to learn without being explicitly programmed"- Arthur Samuel.

Machine Learning: Humans vs Machines

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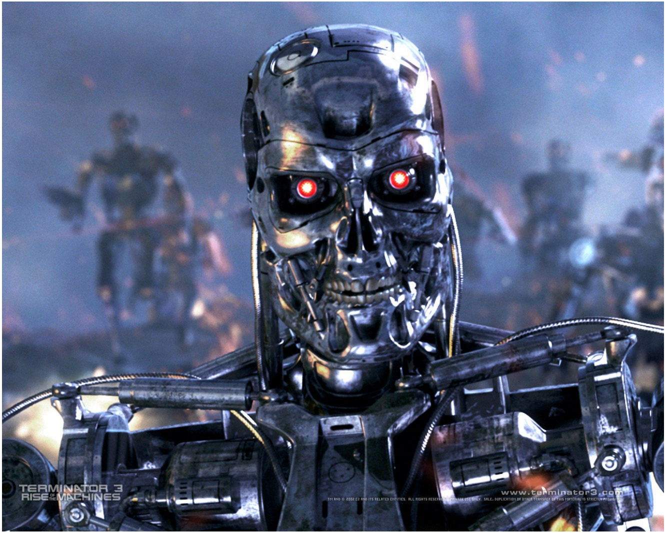
- BUT!
- Humans are slow and computers are blindingly fast.
- So, what if we could give a bit of human intelligence to the computer?

The end of the world!



A more rigorous definition of Machine Learning

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- Lot of big words!
- However, if you think about it, that's exactly what we humans do.

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- Pro tip: Usually you do want some error because many times that's the difference between learning (good) and memorizing (bad)

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- The core question was, how to predict the rating a user is going to give to certain movie after watching it?
- Answer: Machine Learning.

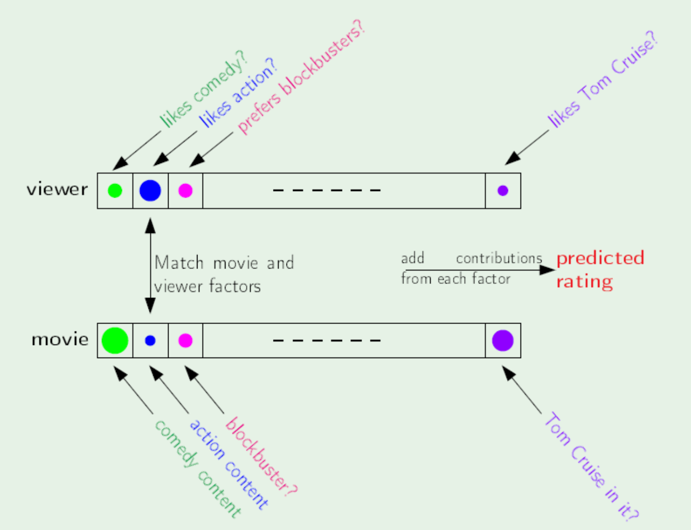

Figure: Source: Abu-Mostafa, Magdon-Ismail, Hsuan-Tien. Learning from Data.

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- In all fairness, this is just one type of learning, there are more. But let's not get ahead of ourselves.

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- You tell me one!

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- Machine Learning is all about discovering relationships
- By lots of repetition, the computer learns from its mistakes and tries to minimize them
- And by minimizing the error, it gradually learns to approximate the right answer
- In order to do Machine Learning, we need...DATA
- I really really wish my linear algebra and calculus teachers had mentioned that those things were useful for ML. Cool stuff after all.

Thank you very much!

Questions?