

AI & Robotics

Machine Learning



Goals



The **junior-colleague**

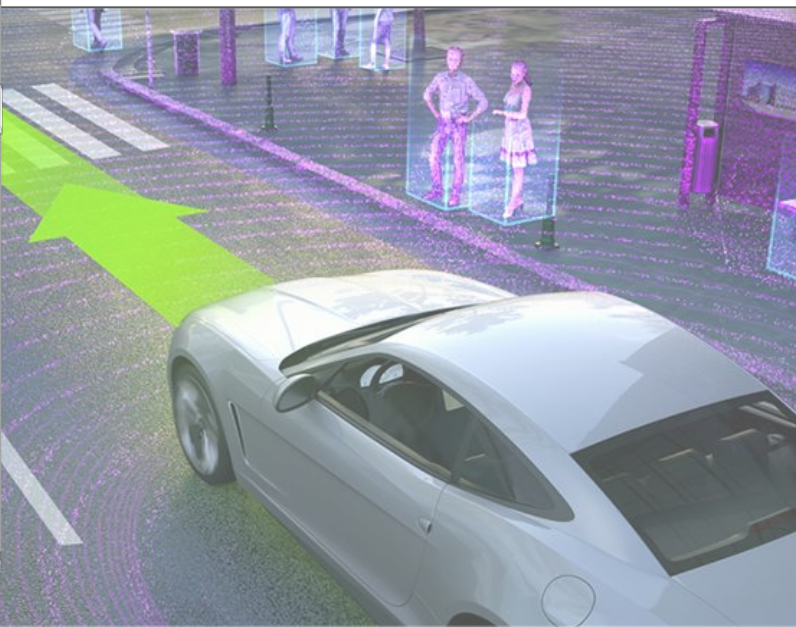
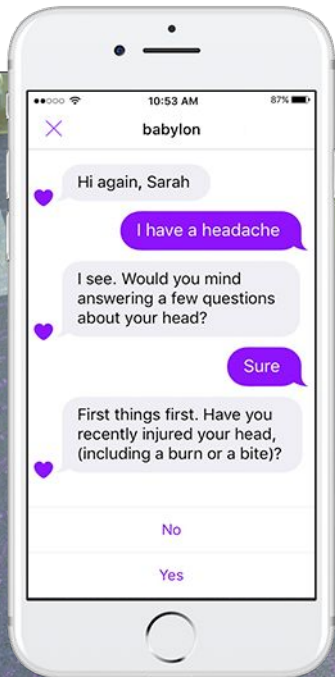
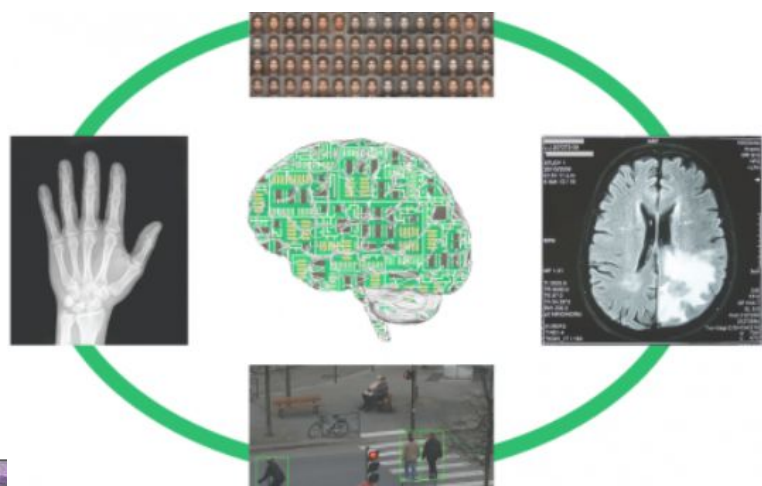
- can explain Machine Learning in their own words
- can situate Machine Learning in the broader context of AI
- can explain the difference between traditional programming and Machine Learning
- can explain the importance of practical Machine Learning
- can describe a standard ML pipeline



NETFLIX



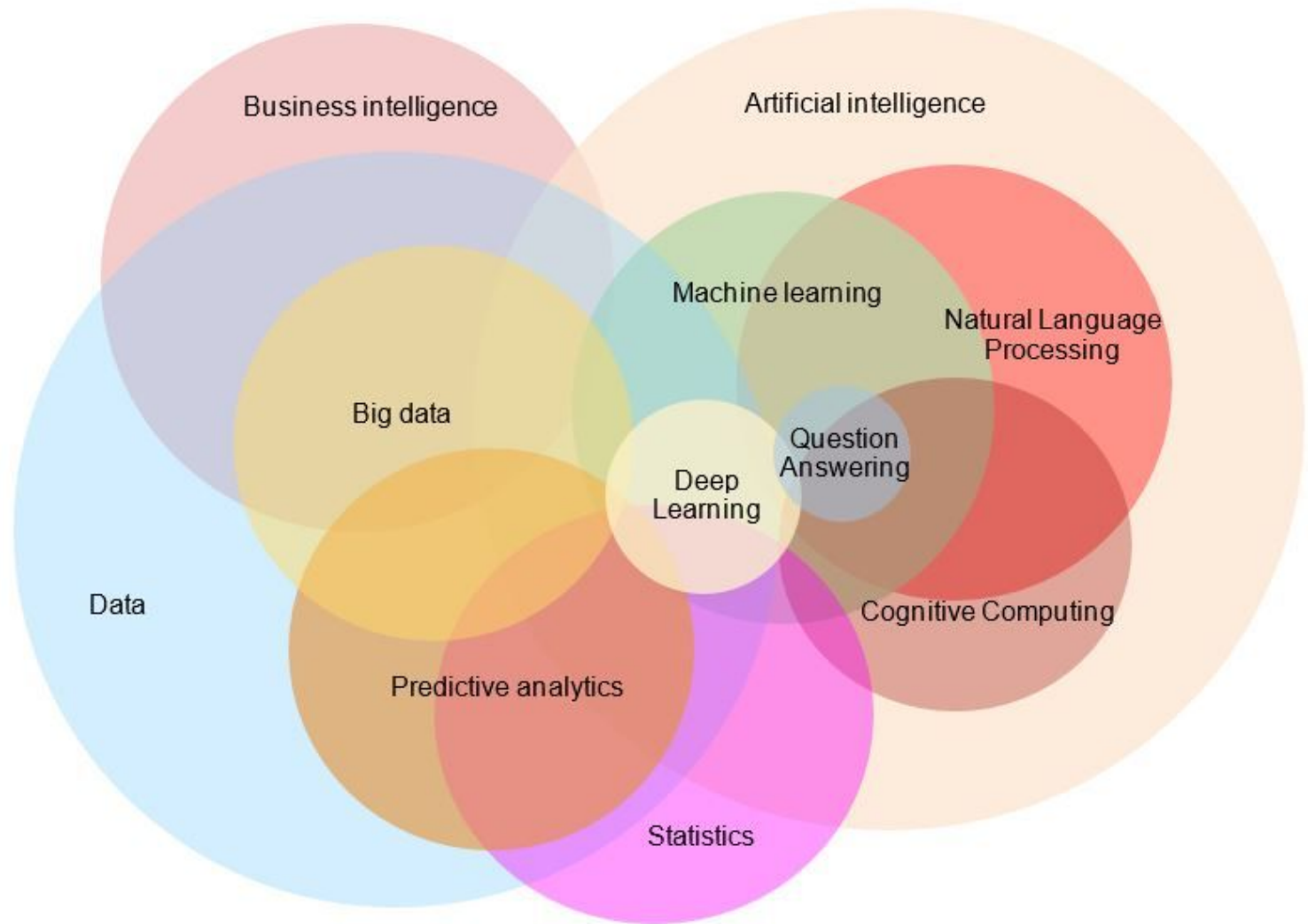
Spotify®

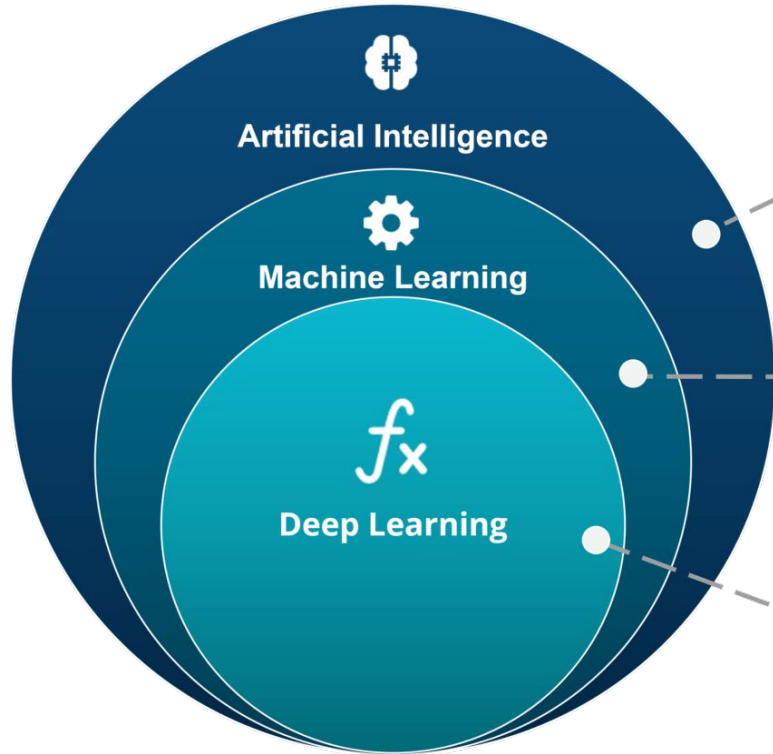


Machine Learning: Definitions

“A branch of artificial intelligence in which a computer generates rules underlying or based on raw data that has been fed into it”

*“A computer program is said to learn from **experience E** with respect to some class of **tasks T** and **performance measure P**,
if its performance at tasks in **T**, as measured by **P**, improves with experience **E**”*





ARTIFICIAL INTELLIGENCE

A technique which enables machines to mimic human behaviour

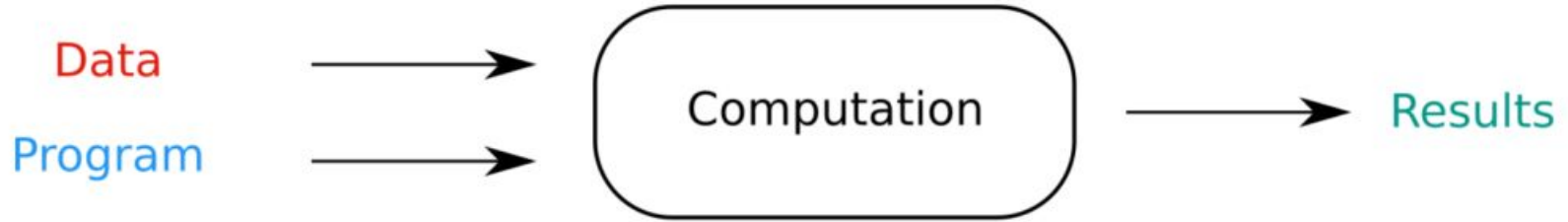
MACHINE LEARNING

Subset of AI technique which use statistical methods to enable machines to improve with experience

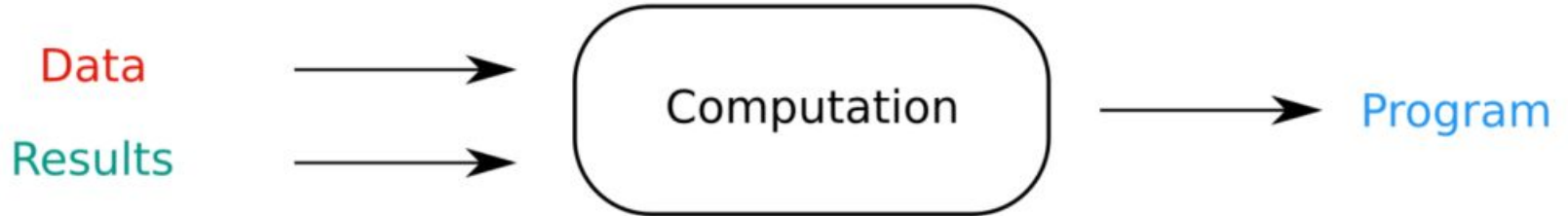
DEEP LEARNING

Subset of ML which make the computation of multi-layer neural network feasible

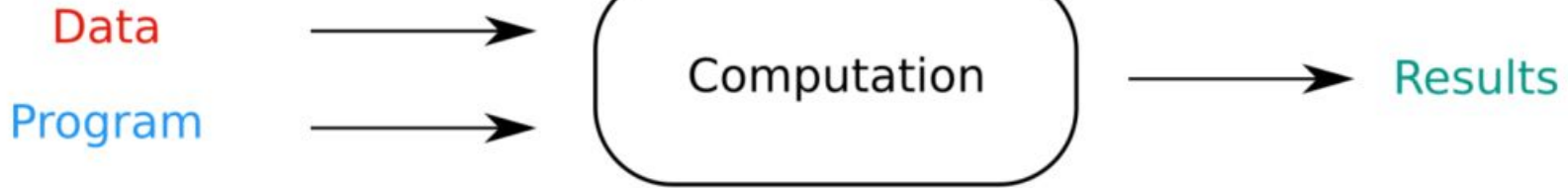
Traditional programming



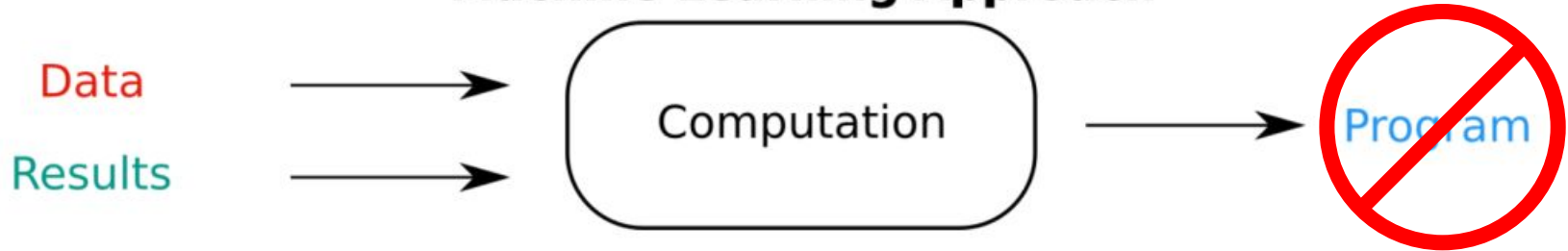
Machine Learning Approach



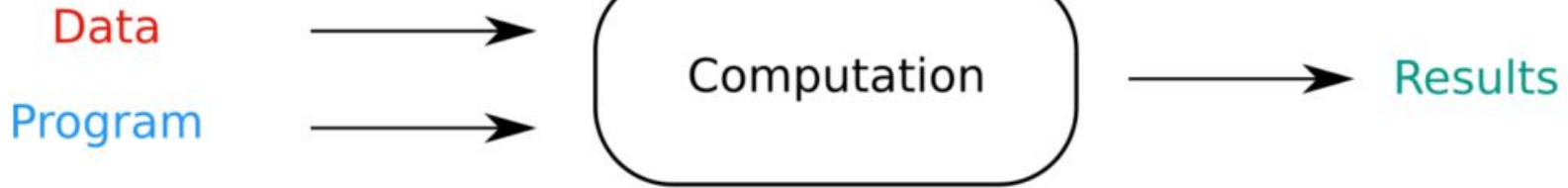
Traditional programming



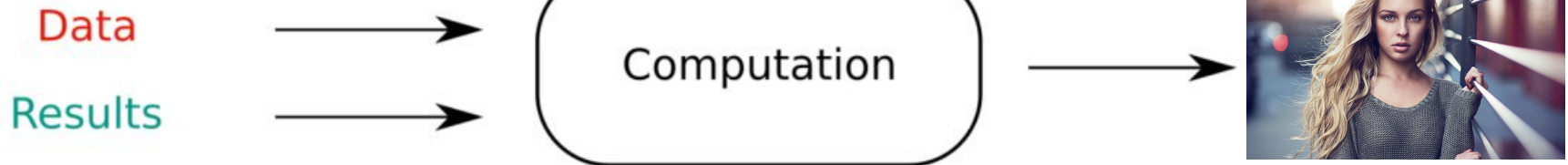
Machine Learning Approach



Traditional programming



Machine Learning Approach



Theory vs Practice

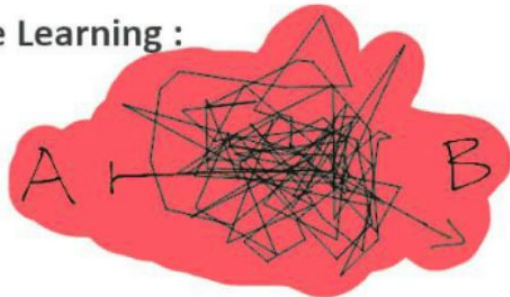
Theory:



Practice:



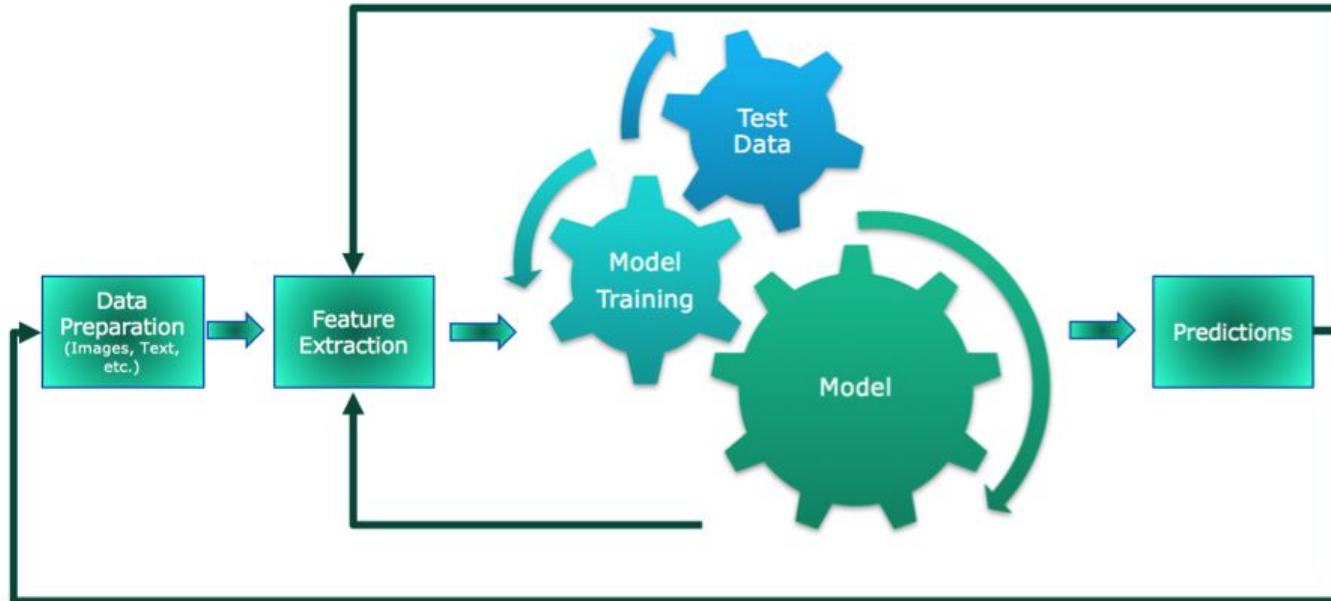
Machine Learning :



- Historically:
 - Theoretical concepts
 - Formal proofs
- Nowadays:
 - More practical, empirical study
 - New insights

Machine Learning

A Standard Machine Learning Pipeline



Machine Learning

