

Artificial Intelligence Overview

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Target Outputs:

- Understanding AI capabilities
- Have some sense about how to make an AI-solution to solve a business problem

Artificial Intelligence Overview

1. What is Artificial Intelligence
2. Limitations of AI
3. Major AI Techniques
4. Some popular AI applications
5. What is Data Science

1. Artificial Intelligence (AI)

What is Artificial Intelligence ?

- AI is an abstract and broad concept
- Using computers to solve tasks that typically require human intelligence
- First used in 1500 BCE (Wikipedia)



2. Limitations

AI is not intelligent

“Weak” Pattern-Based AI: what we have today

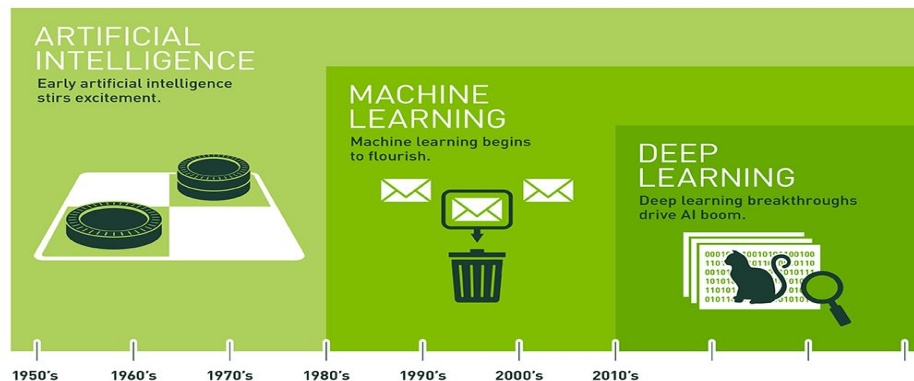
- Computers solve problems by detecting useful patterns
- Has been used to automate many processes today
- Currently is the driving force in CMNC 4.0

“Strong” AI: the intelligent one but we haven't arrived there yet

- Computers thinking at a level that meets or surpasses people
- Computers engaging in abstract reasoning and thinking
- Similar to Avengers

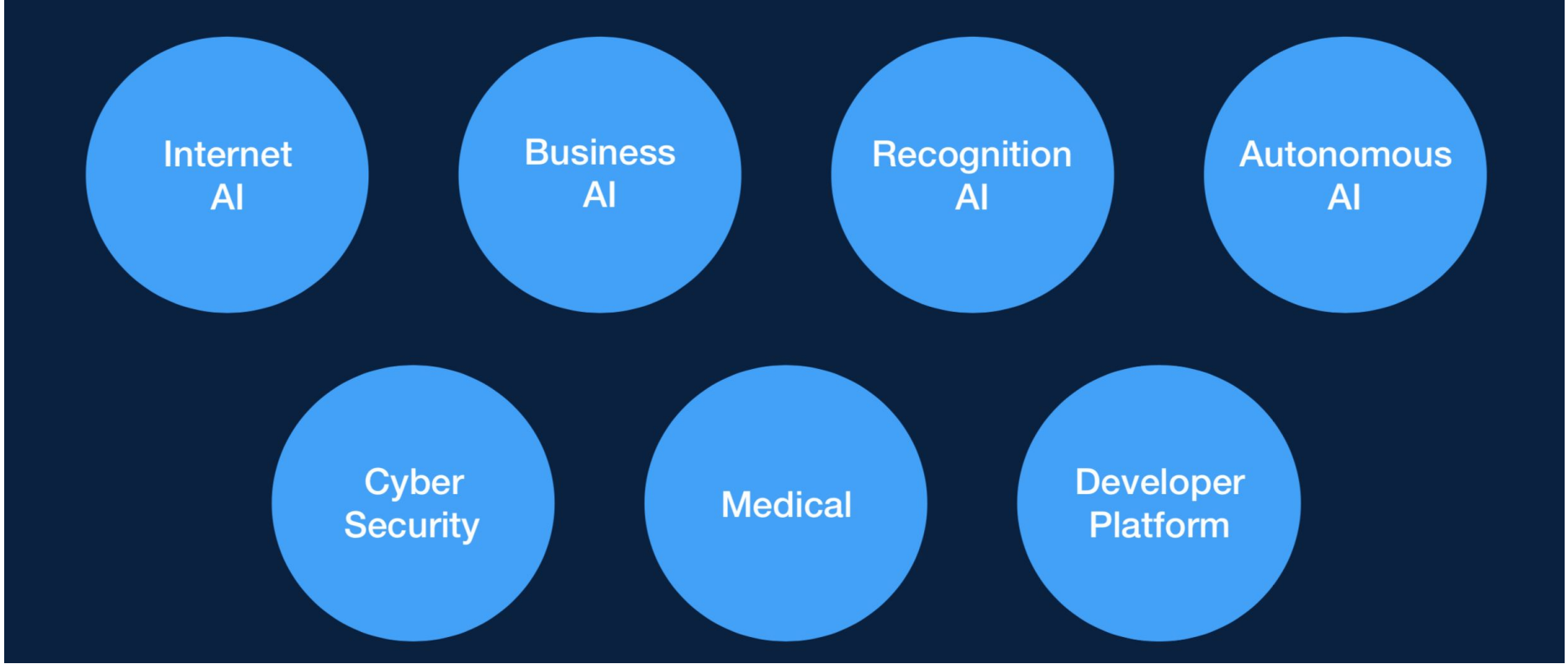
3. Major AI approaches

- Approach 1: Logic and Rule-based Approach: Tax, Accounting Software
- Approach 2: Machine Learning (Pattern-based Approach): Algorithms find **patterns** in data and infer rules on their own => Learn from data (still weak, but more promising than 1)
- Approach 3: Not invented yet



Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

4. AI Applications - Categories



Internet
AI

Business
AI

Recognition
AI

Autonomous
AI

Cyber
Security

Medical

Developer
Platform

4. AI Applications - Machine Translation

Use DL to learn a sequence to sequence between sentences from different languages

似乎格式有問題

English output

translation
model

language
model

parallel corpus

网站资讯分析网数据
显示的主域名为
全世界访问量最高
的站点除此之外搜
索在其他国家或地
区域名下的多个站
点等等及旗下的等

The corporation has been estim
to run more than one million pag
in data centers around the world
to process over one billion searc
requests and about twenty-four i
of user-generated data each dat
December 2012 Alexa listed as

monolingual corpus

started functioning in 1928 and established the tradition of
large exhibitions and trade fairs held in Brno, and nowadays
also ranks among the sights of the city. Brno is also
known for hosting big motorbike and other races on the
Masaryk Circuit, a tradition established in 1930 in which
the Road Racing World Championship Grand Prix is
one of the most prestigious races. Another notable cultural
tradition is an international fireworks competition.

4. AI Applications - Consumer Marketing

- General changes in consumer behavior
- Tracking responses to new products
- Identifying customer segments: targeted marketing, e.g., they find out that consumers with sports cars who buy textbooks respond well to offers of new credit cards.



4. AI Applications - Predicting the Stock Market

- Given the past, predict the future
- Very difficult problem!
- We can use learning algorithms to learn a predictive model from historical data
 - $\text{prob}(\text{increase at day } t+1 \mid \text{values at day } t, t-1, t-2, \dots, t-k)$



Appendix: AI Applications - Others

- Recommendation System
- Entity Recognition from scanned Images
- Brand Tracking
- Intelligent Candidate Matching for Recruitment
- Security surveillance
- Customer Segmentation
- Speech2Text, Speaker Recognition
- Chatbot

Recap

- AI - Trí tuệ nhân tạo: a human dream, a sign of evolution, a myth (we're just so lazy, and we want to build something that can reduce our workload)
- Thanks to the development of hardware and data abundance many of those dreams can be realized NOW
- Many of ML-based theories were first developed in 50s, 60s of the 20th century.
- AI is more like a human's **vision**; now, it's human **mission** to build those aforementioned "intelligent" applications and ML is the **tool** that helps us complete this mission.

5. AI vs Data Science

- Data science is the extraction of relevant insights from data. It uses various techniques from many fields like:
 - Mathematics
 - Machine learning
 - Data engineering and visualization
 - Pattern recognition and learning
 - Uncertainty modeling
 - Data warehousing, and cloud computing

=> AI and Data Science are two different fields.

Thank you !

Q & A