



Recent Advancement in Learning Algorithms

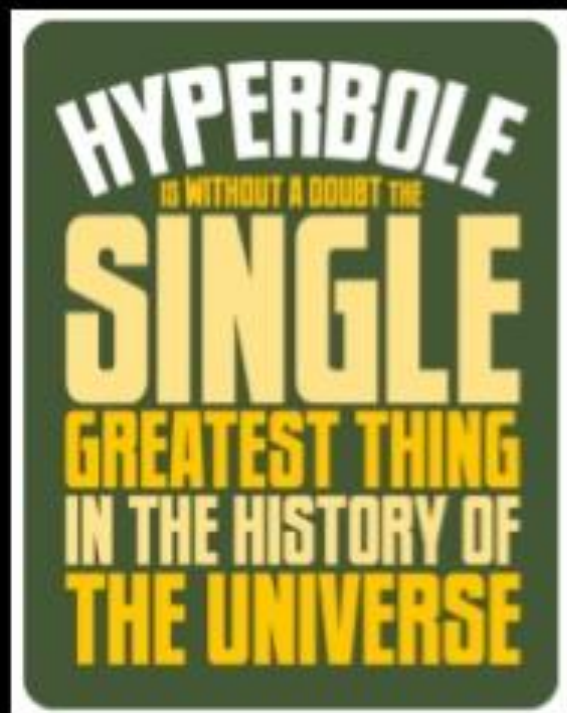
Dr. Liron Izhaki Allerhand
Senior Data Scientist, Microsoft

An offshore oil rig is silhouetted against a bright sunset sky over the ocean. The sun is low on the horizon, creating a warm orange glow. The rig's complex structure, including a tall derrick and various platforms, is visible against the light sky. The ocean surface shows gentle waves in the foreground.

**“Data is the
new Oil”**

– Clive Humby

Hype



Data is...

"the new gold"

"the new black"

"the new plastic"

"the new oil"

"the new frontier"



הנבחרת: 20 הסטארט-אפים
הישראליים החמים של 2018



Outline

- Learning Algorithms
 - Classic tasks
 - Learning tasks in BI
- Deep learning
- Generative models
- Text analysis

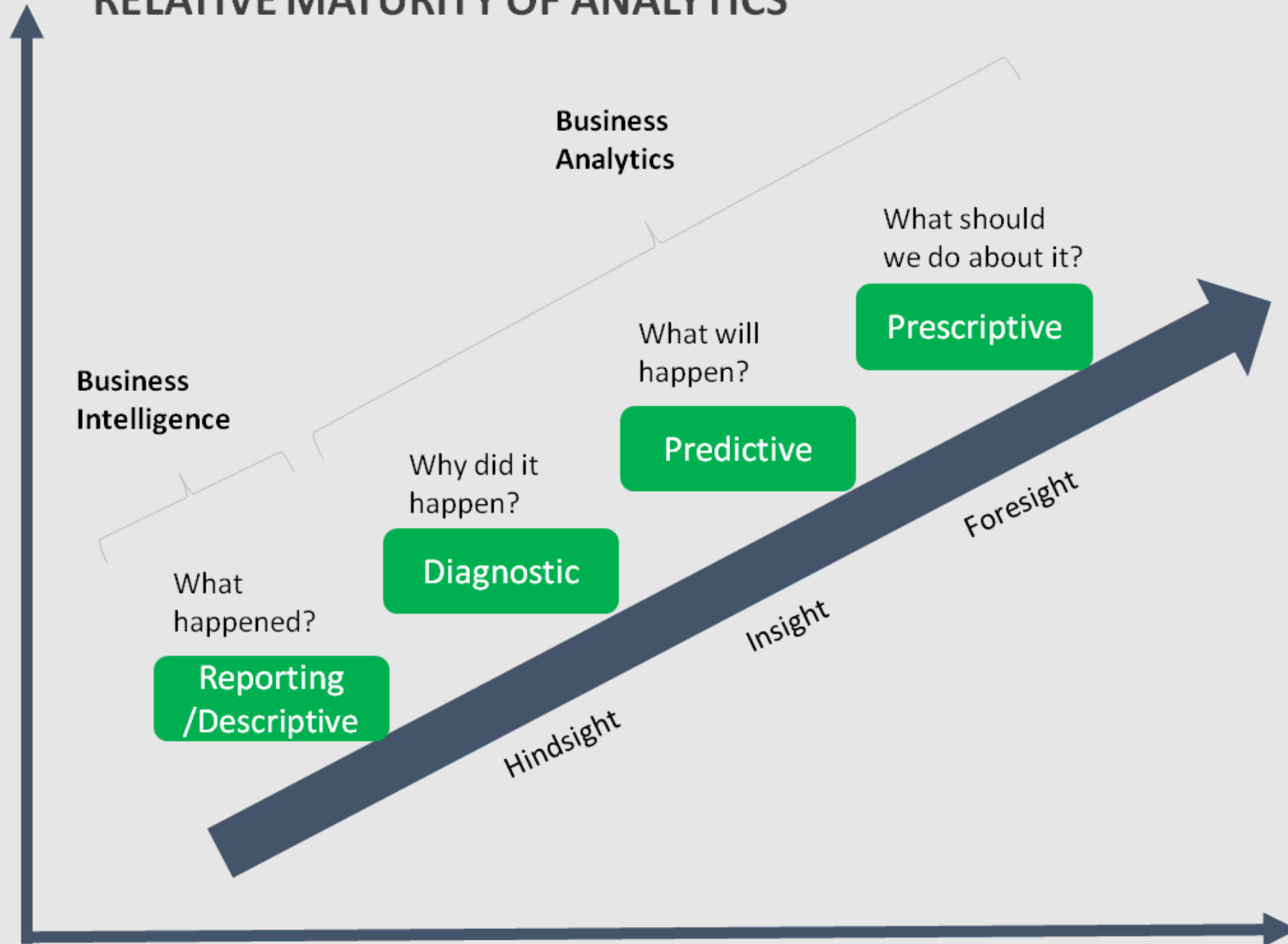
Learning algorithms

- An algorithm is a series of actions that achieves a goal
- Why learn?
- Learning algorithm (unformal definition): an algorithm that improves its own performance by using data.
- Machine learning vs. deep learning
- Machine learning vs. big data

Classic tasks

- Classification
 - Churn analysis
- Regression
 - How much inventory do I need
 - How long will this route take
- Clustering
 - What kind of clients do I have
- Anomaly detection
 - Process monitoring

RELATIVE MATURITY OF ANALYTICS





REVISED & UPDATED

PREDICTIVE ANALYTICS

**The Power to
Predict Who Will Click,
Buy, Lie, or Die**

BUY THE BOOK

Deep learning

- New algorithms
- Transfer learning
- Raw data
- CNNs and RNNs
- New tasks



GANs

- Generate new samples
- How does it work?
- Indistinguishable?
- Is that useful?



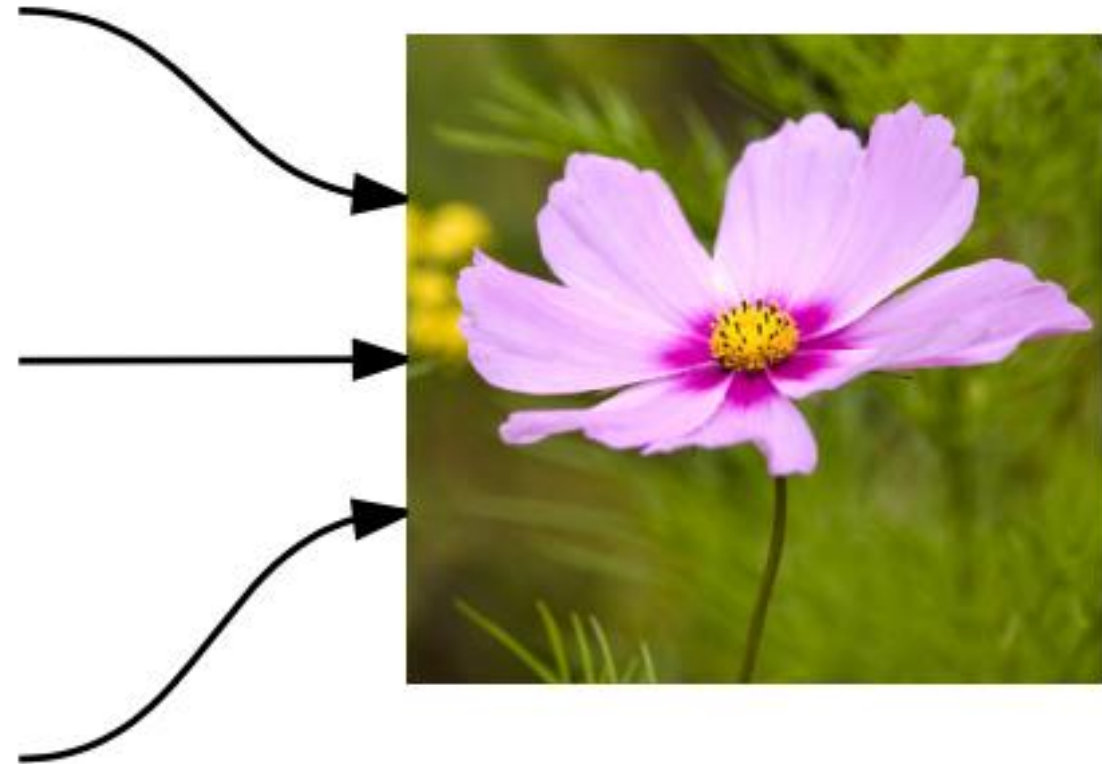




A: This flower has tiny bright pink pedals

B: This flower has tiny bright pink pedals +
with short yellow stamen +

C: This flower has tiny bright pink pedals +
with short yellow stamen +
plus sparse long purple stamen





This



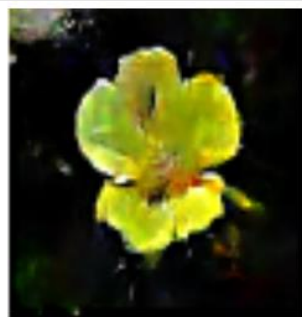
flower



is



yellow



and



black



in



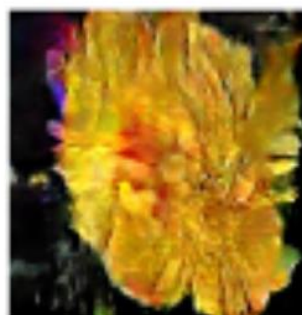
color



and



has



petals



that



are



oval



shaped

What we want

- Conditional generation
- Explain classifications?
- Predictive and descriptive

Class: White Necked Raven

Counter-Class: Bobolink



This is a *White Necked Raven* because this is a black bird with a white nape and a large beak. This is not a *Bobolink* because it does not have a yellow nape.

Class: Ruby Throated Hummingbird

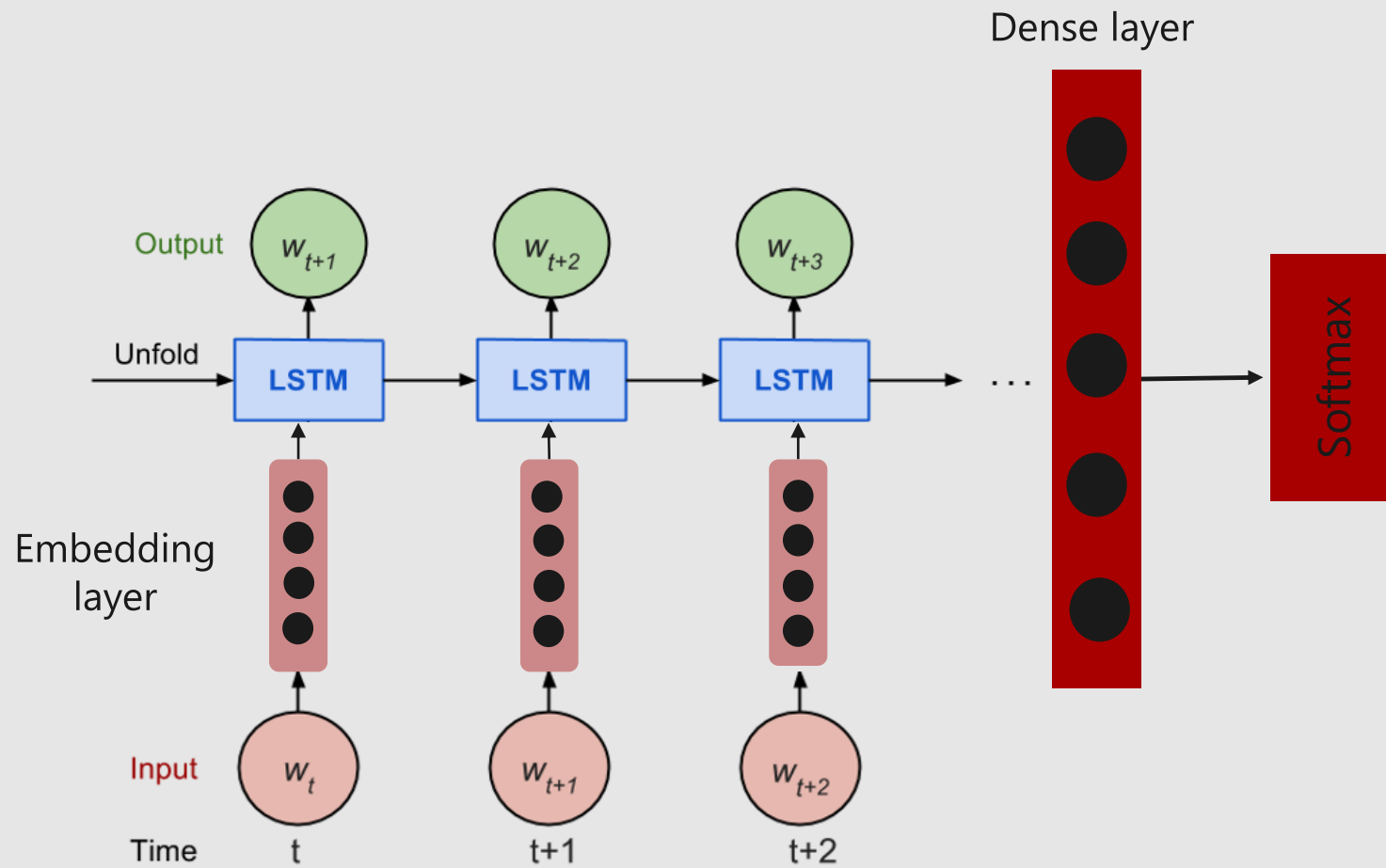
Counter-Class: Marsh Wren



This is a *Ruby Throated Hummingbird* because this bird has a white belly and breast with a long needle-like bill. This is not a *Marsh Wren* because it does not have a short pointy bill.

Business applications

- Relational data
- Generative planning
- Text
 - Reading text
 - Explain text
 - New tasks



pork belly = delicious .

scallops ?

i do n't .

even .

like .

scallops , and these were a-m-a-z-i-n-g .

fun and tasty cocktails .

next time i 'm in phoenix , i will go

back here .

highly recommend .

Original Text (truncated): lagos, nigeria (cnn) a day after winning nigeria's presidency, *muhammadu buhari* told cnn's christiane amanpour that **he plans to aggressively fight corruption that has long plagued nigeria** and go after the root of the nation's unrest. *buhari* said he'll "rapidly give attention" to curbing violence in the northeast part of nigeria, where the terrorist group boko haram operates. by cooperating with neighboring nations chad, cameroon and niger, **he said his administration is confident it will be able to thwart criminals** and others contributing to nigeria's instability. for the first time in nigeria's history, the opposition defeated the ruling party in democratic elections. *buhari* defeated incumbent goodluck jonathan by about 2 million votes, according to nigeria's independent national electoral commission. **the win comes after a long history of military rule, coups and botched attempts at democracy in africa's most populous nation.**

Pointer-Gen + Coverage: *muhammadu buhari* says he plans to aggressively fight corruption that has long plagued nigeria. he says his administration is confident it will be able to thwart criminals. the win comes after a long history of military rule, coups and botched attempts at democracy in africa's most populous nation.

My work

- Emotion analysis
- Attack clustering
- Parkinson identification

Conclusion

- Classic tasks
- Deep learning
- GANs
- Text analytics



Thank you