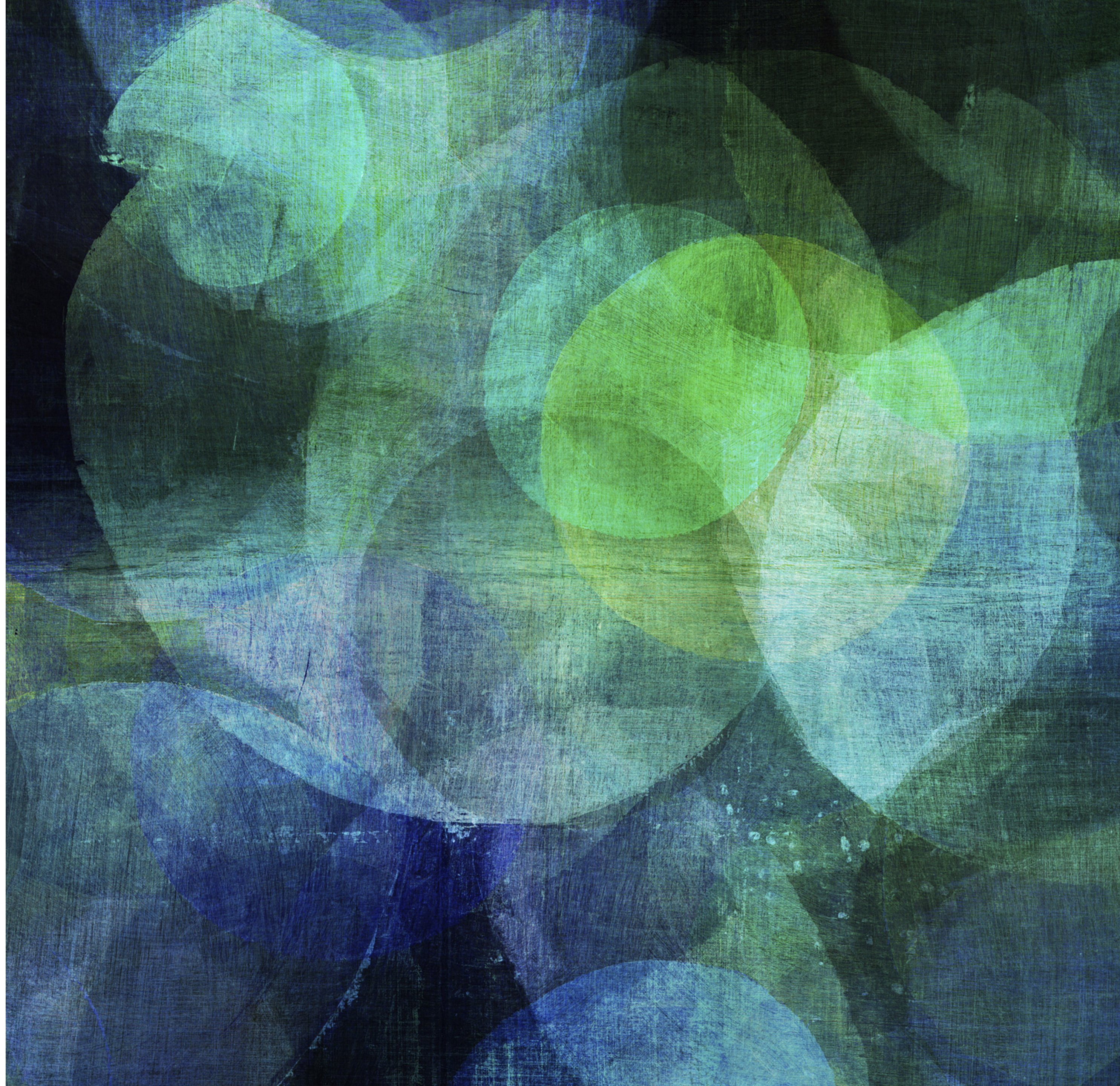




# ARTIFICIAL INTELLIGENCE

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*Presenter's Name*





“

If you're not concerned about AI safety, you should be.  
Vastly more risk than North Korea.

*Elon Musk, Co-Founder of OpenAI*

# ARTIFICIAL INTELLIGENCE

IS NOT NEW

## ARTIFICIAL INTELLIGENCE

Any technique which enables computers to mimic human behavior



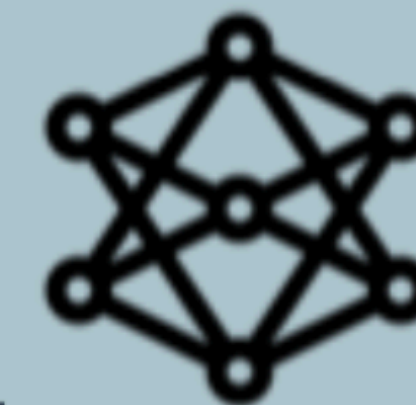
## MACHINE LEARNING

AI techniques that give computers the ability to learn without being explicitly programmed to do so



## DEEP LEARNING

A subset of ML which make the computation of multi-layer neural networks feasible



1950's

1960's

1970's

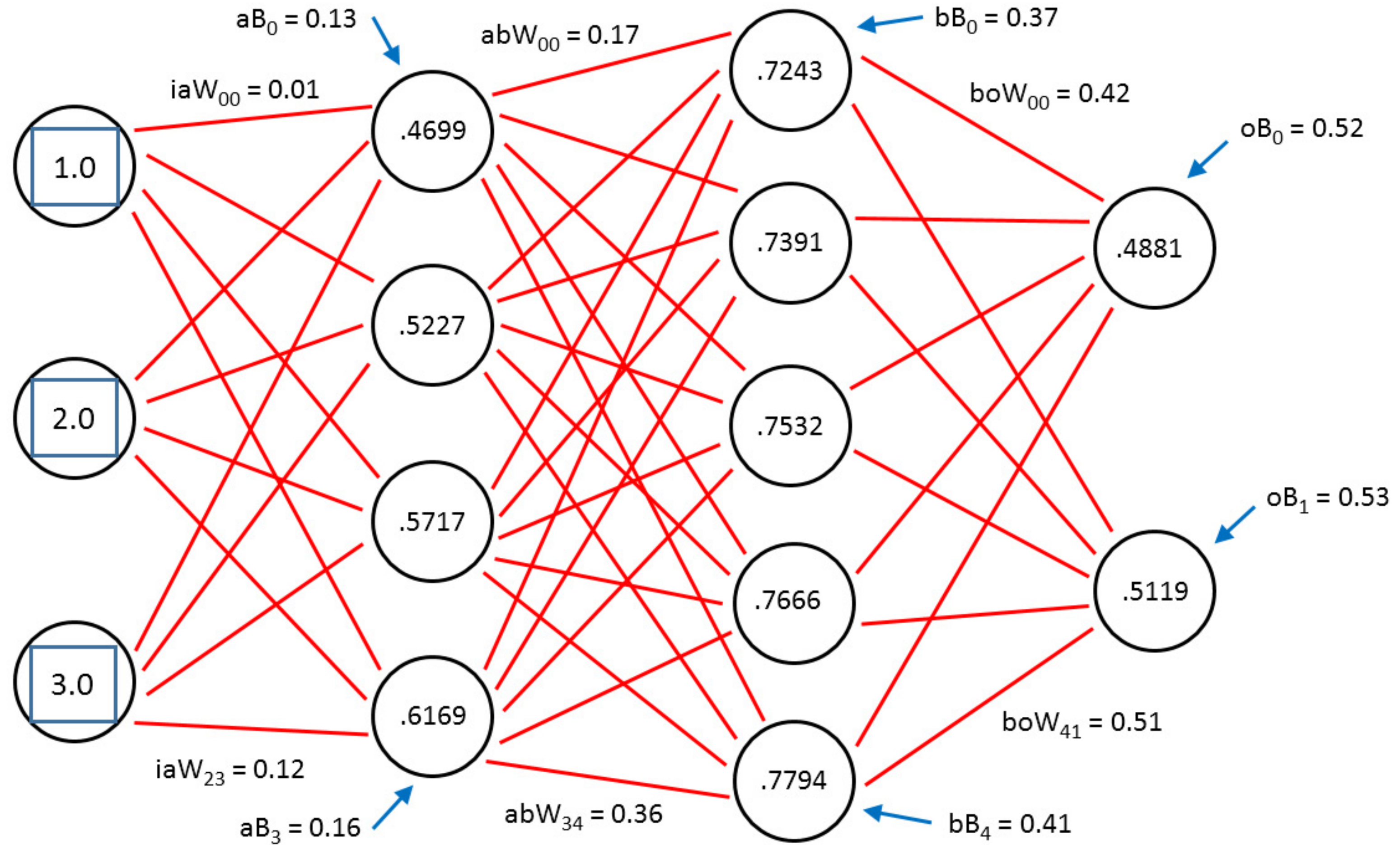
1980's

1990's

2000's

2010s

# MATH – NOT MAGIC



# BLACKBOX DEEP LEARNING



```
def parse(ele):
    tags = []
    p_chilids = []
    for child in ele.getchildren():
        tags.append(child.tag)
        p_chilids.append((child.tag, parse(child)))

    if not tags:
        text = ele.text
        if text is not None:
            text = text.strip()
        else:
            text = ''
        return text

    if len(set(tags)) < len(tags):
        result = [dict([x]) for x in p_chilids]
    else:
        result = dict(p_chilids)
    return result
```

```
[[ 0.25220302  0.11511192  0.0163588 ]
 [ 1.0738693 -0.7634842 -0.157458 ]
 [ 0.5605114  0.8958491 -0.26361734]
 [-0.62062514 -0.09703063  0.05351747]
 [ 0.15930913  0.6957228  0.07676612]
 [-0.04856482 -0.43702808 -0.13835646]
 [-0.9382198 -0.23191477  0.05951922]
 [-0.17589411  0.2136788  0.35101604]
 [ 0.17986652 -0.3714285  0.42584503]
 [ 0.14542913 -0.7979377 -0.69154394]
 [-0.15757537  0.32076323 -0.3568135 ]
 [-0.70873  0.5540788  0.18767524]
 [-0.32280836 -0.5760054  0.19010675]
 [-0.4390954  0.76553553  0.5268019 ]
 [-0.3994884  0.13099937 -0.67759687]
 [ 0.34810024  0.09697895  0.73624176]
 [-1.3933676  0.34472686  0.30774367]
 [-0.03799042  0.1172722  0.09084484]
 [-0.00241334  0.275934  0.85698926]
 [-0.23845994 -0.09959842  0.13337235]
 [-0.06941856 -0.8051505  0.9890129 ]
 [-0.859635 -0.5075154 -1.4599352 ]
 [-1.040613  1.1075947  0.07151227]
 [-0.04303781  1.3437535 -0.09375248]
 [-0.67934465 -0.2674026  0.6049979 ]
 [ 0.6012358  0.11391988 -0.62304693]
 [ 0.08587748  0.19357371 -0.49013826]
 [ 0.32509542  0.31584287 -0.16457611]
 [ 0.24657239  0.37425002 -0.26788527]
 [ 0.28622705  0.01975548  0.52464277]
 [-0.18026644  0.05730053  0.1607559 ]
 [ 0.2677654 -0.25159255  0.33531034]
 [ 0.14421976 -0.27371338  0.49477383]
 [-0.02851635 -0.0065761  0.14936276]
 [-0.10188974  0.12084729 -0.07696906]
 [ 0.01919901  0.1149652  0.24633239]
 [ 0.02273789 -0.00787542 -0.01457231]
 [ 0.19186051  0.1791315  0.21262085]
```



“

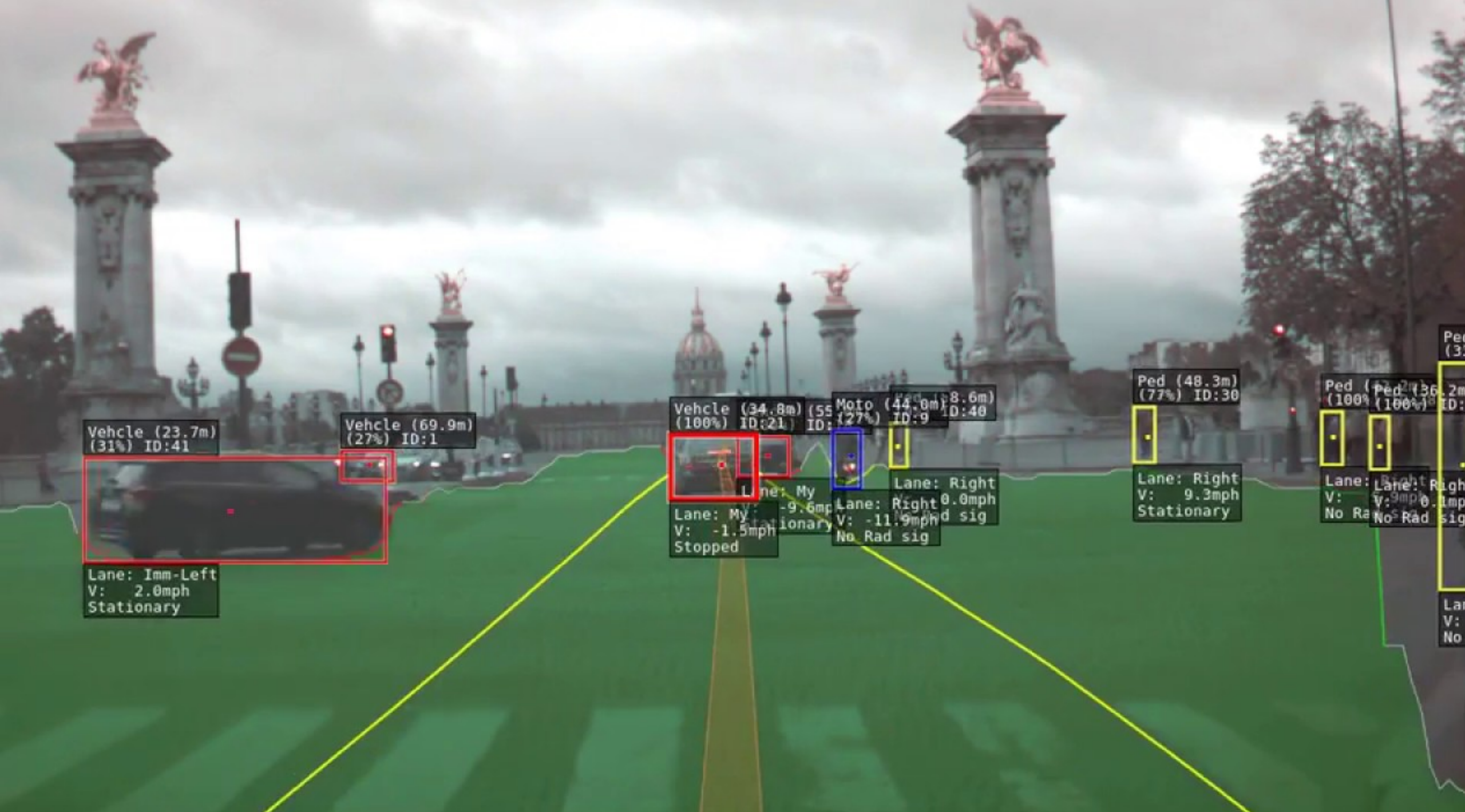
Artificial Intelligence is the new electricity.

*Andrew Ng, co-founder of Google Brain*

# WHERE IT HELPS

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- Computer vision
- Text processing
- Robots
- Everywhere, where we have many different states





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Is artificial intelligence less than our intelligence?

*Spike Jonze, director of Her*

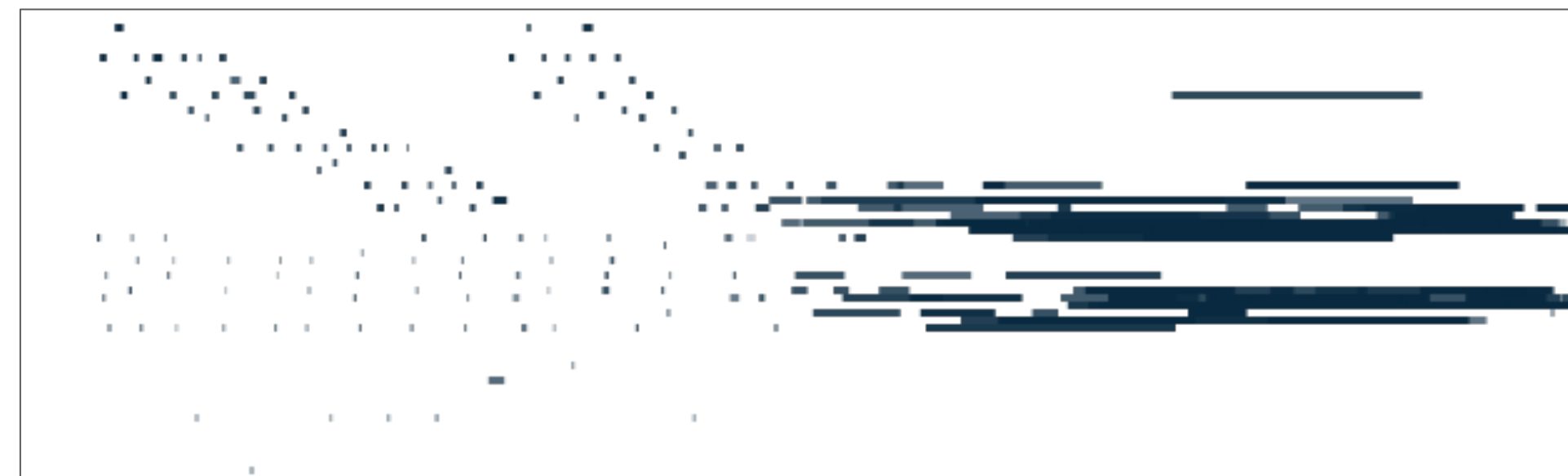
# PROGRESS IN AI COMPOSING



2017



Early 2018

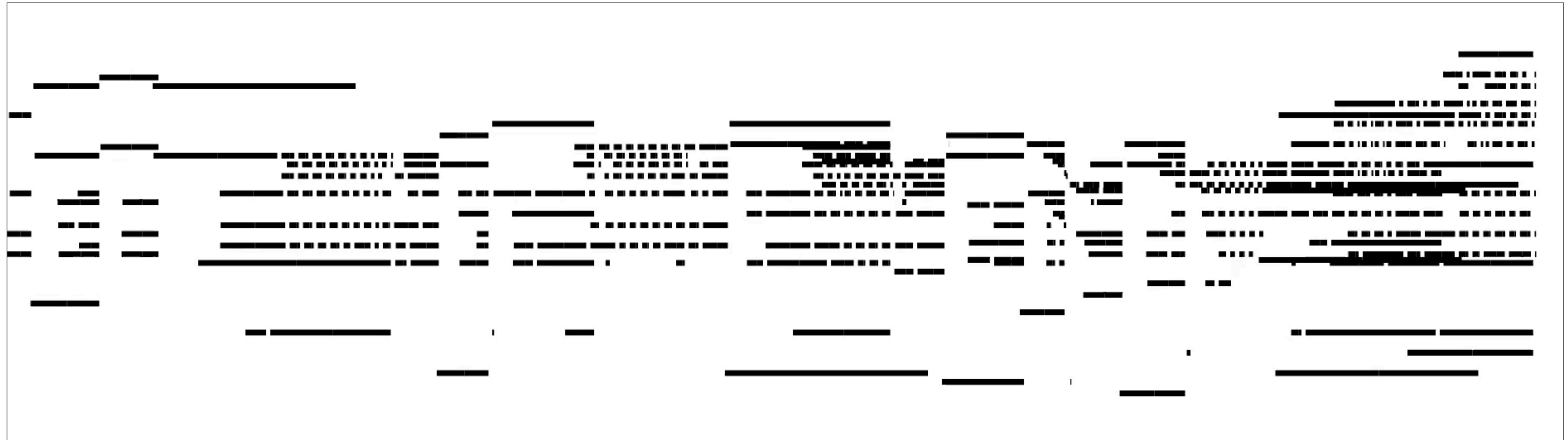


Dec 2018



Source: <https://magenta.tensorflow.org/music-transformer>

# PROGRESS IN AI COMPOSING



Source: <https://magenta.tensorflow.org/music-transformer>

# AI MUSIC

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- Can be based on existing music
  
- Or compose something completely new

Source: <https://magenta.tensorflow.org/music-transformer>, <https://openai.com/blog/musenet/>

The background is an abstract composition of overlapping, torn paper scraps in various shades of red, orange, yellow, and pink. The pieces are layered and slightly offset, creating a textured, collage-like effect. The colors are warm and vibrant, with some darker reds and oranges interspersed with lighter pinks and yellows.

# DISCUSSION

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*What makes us humans special?*