Telstra Purple

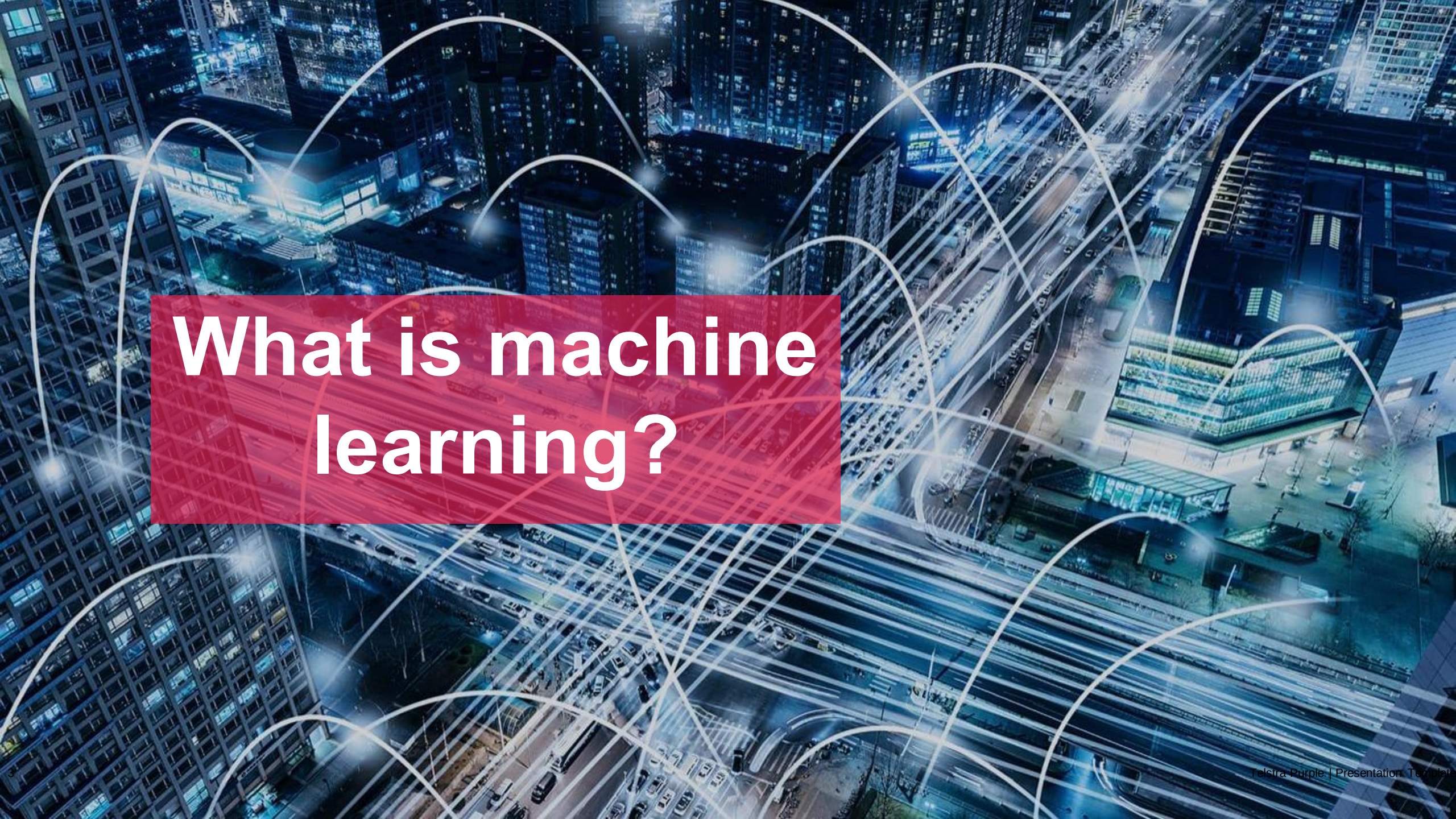
# Introduction
# Machine Learning 101
## Graduate Workshops 2020

Paula Tattam | Consultant, Data Science

24/02/2020

# Agenda

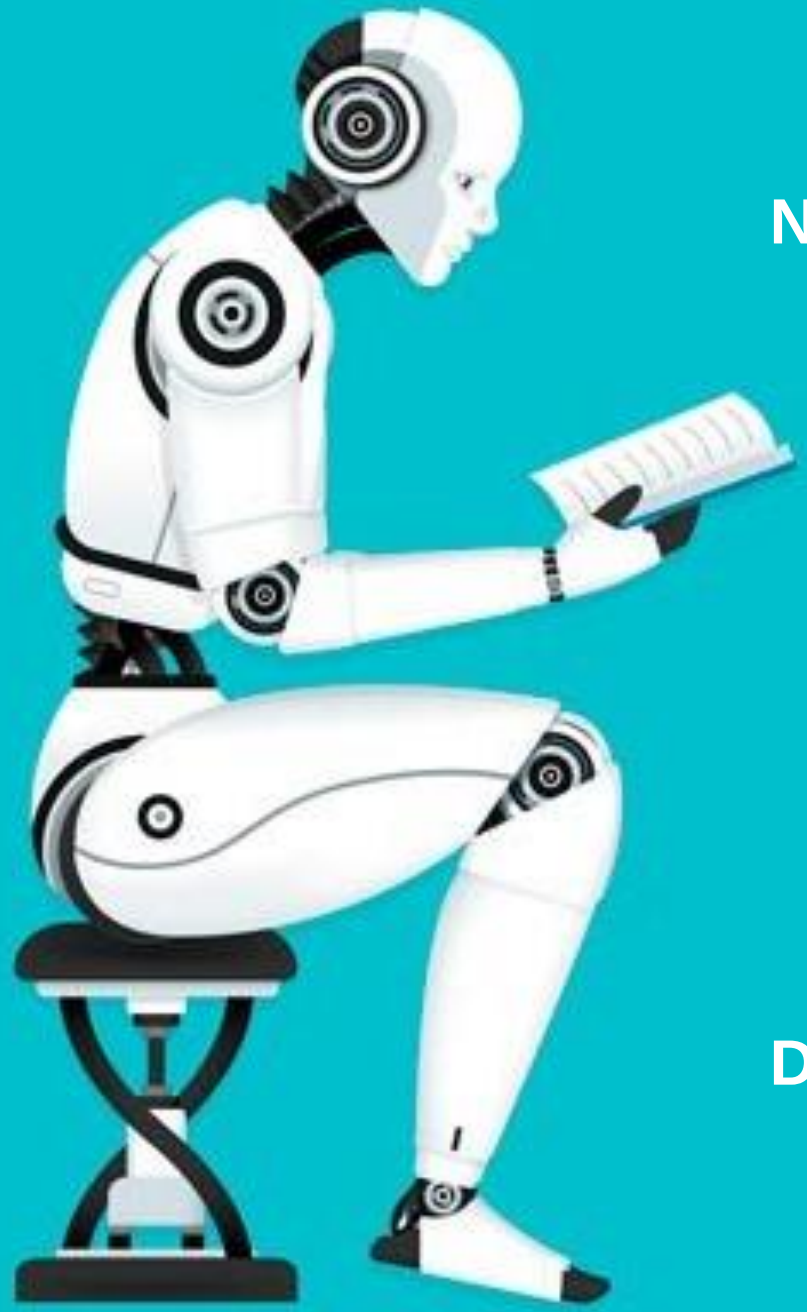
| | QLD | NSW & VIC | WA |
|---|---|---|---|
| Introduction | 11:00am | 12:00pm | 9:00am |
| Coding Exercise | 11:45am | 12:45pm | 9:45am |
| **Short Break** | **12:15pm** | **1:15pm** | **10:15am** |
| Coding Exercise | 12:30pm | 1:30pm | 10:30am |
| **Long Break** | **1:30pm** | **2:30pm** | **11:30pm** |
| Techie Bits | 2:00pm | 3:00pm | 12:00pm |
| **Finish** | **3:30pm** | **4:30pm** | **1:30pm** |


What is machine learning?

Un-supervised learning

Supervised learning

Reinforcement learning



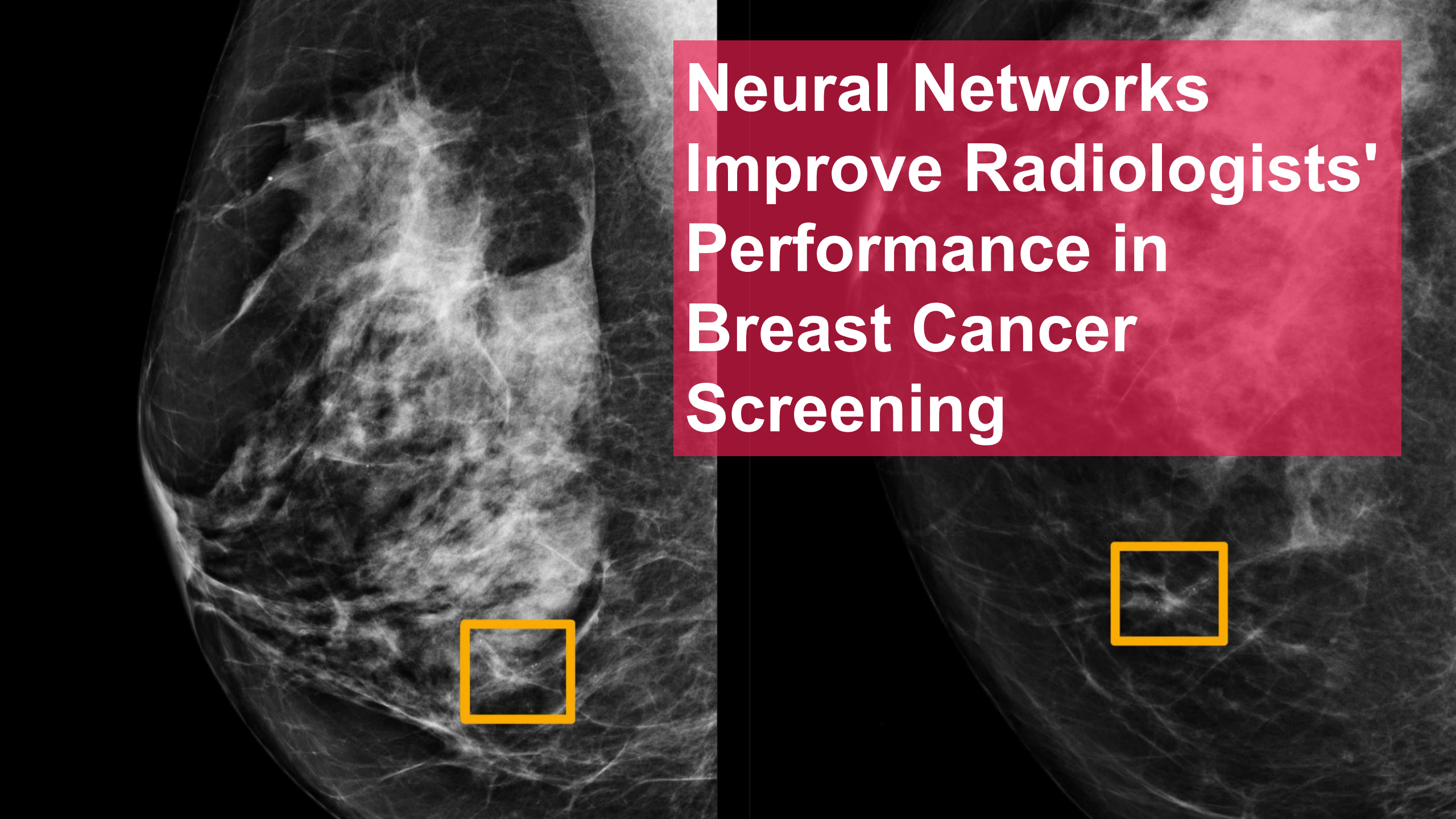
Neural networks

Regression analysis

Support vector machines

Decision trees

# Audio-based automatic mating success prediction of giant pandas



# Neural Networks Improve Radiologists' Performance in Breast Cancer Screening


# Microsoft's Soundscape app helps blind people get around town with 3D audio cues

# NISQUALLY RIVER FOUNDATION

MEASURE AND MONITOR THE FISH SPECIES

VIDEO CAMERA & INFRARED SENSORS

FISH LADDER

CAPTURES 30 SEC OF VIDEO

MORE THAN 3,000 VIDEOS ARE GENERATED

MANUALLY IDENTIFY

30 VIDEOS AN HOUR

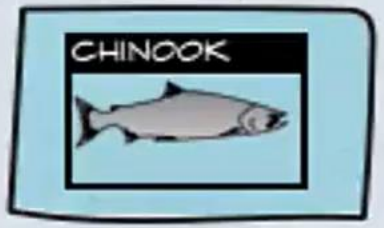
100 HOURS TO COMPLETELY ANALYZE

RESOURCE INTENSIVE, FROM A TIME, HUMAN RESOURCES, AND COST PERSPECTIVE

THE MICROSOFT AI FOR EARTH PROGRAM & GRAMENER

EXTRACT THE RELEVANT FRAMES

IDENTIFY THE SPECIES




AUTOMATED AI SOLUTION

1. MICROSOFT AZURE
2. COGNITIVE SERVICES PLATFORM STACK.

CONTACT@GRAMENER.COM

# What is bias?

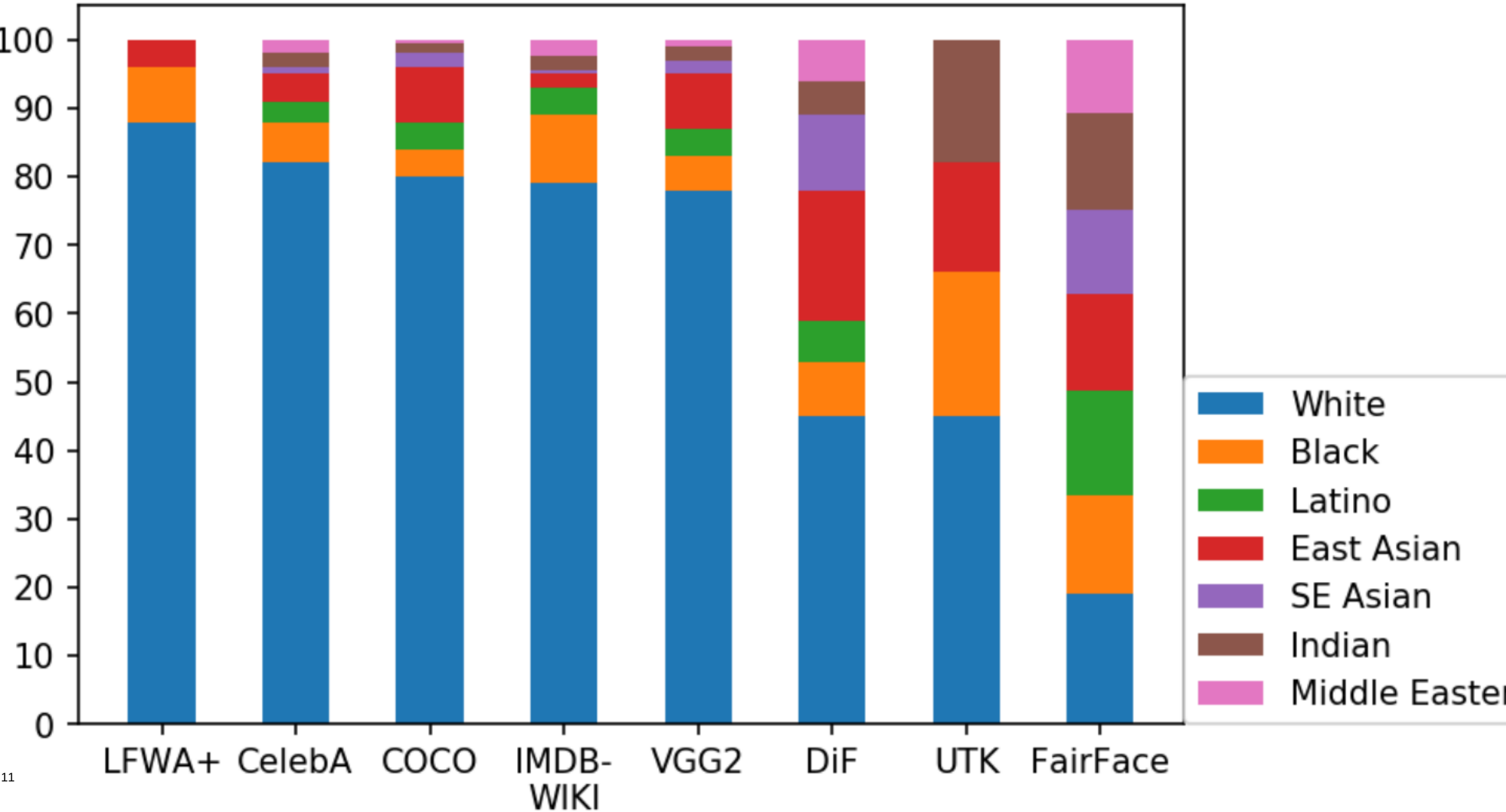
**“Bias is a phenomenon that occurs when an algorithm produces results that are systematically prejudiced…”**

Source | Tech Target
https://searchenterpriseai.techtarget.com/definition/machine-learning-bias-algorithm-bias-or-AI-bias

# How does something become biased?

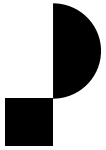
**Bias can be introduced when there is an imbalance in our training data.**

| LFW * accuracy (%) | CFP-FF * accuracy (%) | CFP-FP * accuracy (%) |
|---|---|---|
| 99.77 | 99.83 | 94.21 |


100
90
80
70
60
50
40
30
20
10
0
LFWA+
CelebA
COCO
IMDB-WIKI
VGG2
DiF
UTK
FairFace
White
Black
Latino
East Asian
SE Asian
Indian
Middle Easter

Labeled Faces in the Wild is a public benchmark for face verification, also known as pair matching. No matter what the performance of an algorithm on LFW, it should not be used to conclude that an algorithm is suitable for any commercial purpose. There are many reasons for this. Here is a non-exhaustive list:

- Face verification and other forms of face recognition are very different problems. For example, it is very difficult to extrapolate from performance on verification to performance on 1:N recognition.
- Many groups are not well represented in LFW. For example, there are very few children, no babies, very few people over the age of 80, and a relatively small proportion of women. In addition, many ethnicities have very minor representation or none at all.
- While theoretically LFW could be used to assess performance for certain subgroups, the database was not designed to have enough data for strong statistical conclusions about subgroups. Simply put, LFW is not large enough to provide evidence that a particular piece of software has been thoroughly tested.
- Additional conditions, such as poor lighting, extreme pose, strong occlusions, low resolution, and other important factors do not constitute a major part of



‘Creative … motivating’ and fired

There’s software used across the country to predict future criminals. And it’s biased against blacks.

Amazon reportedly scraps internal AI recruiting tool that was biased against women

Police across the US are training crime-predicting AIs on falsified data

# But don’t despair!


# Next: hands on machine learning model development and training

https://github.com/ptats/ml101-grad-workshop