Proyectos de Computer Vision End-to-End

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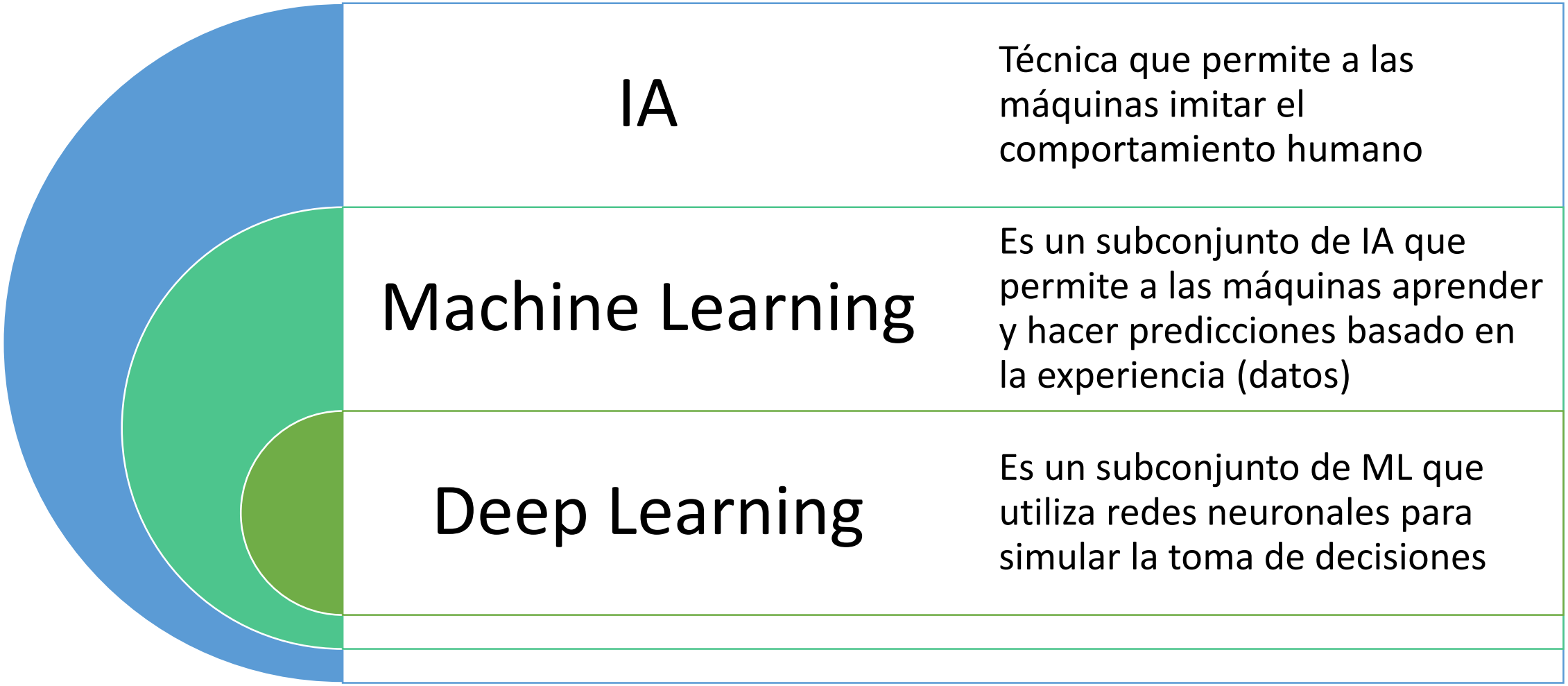
Agenda

- Inteligencia Artificial
- Computer Vision
- Computer Vision: Aplicaciones y Casos de Uso
- Proyectos Open Source
- DEMO: DL4CV End-to-End Project

Inteligencia Artificial

IA vs Machine Learning vs Deep Learning



ML: Programar lo “NO programable”

$f(x)$ { Is this a face?

$f(x)$ { Price of Shirt?

“It has **exquisite** buttons … with **long sleeves** …works for casual as well as **business** settings”

ML: Programar lo “NO programable”

Machine Learning creates a

$f(x)$

Model

Using this data

Face

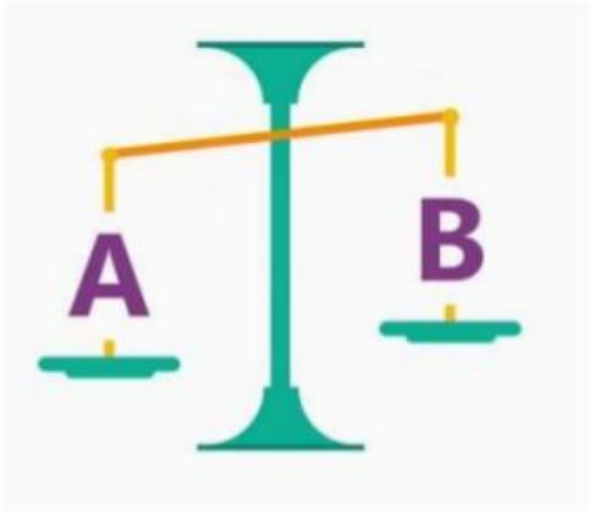
Face

Not a face

Not a face

ML: Tareas

Is this A or B?

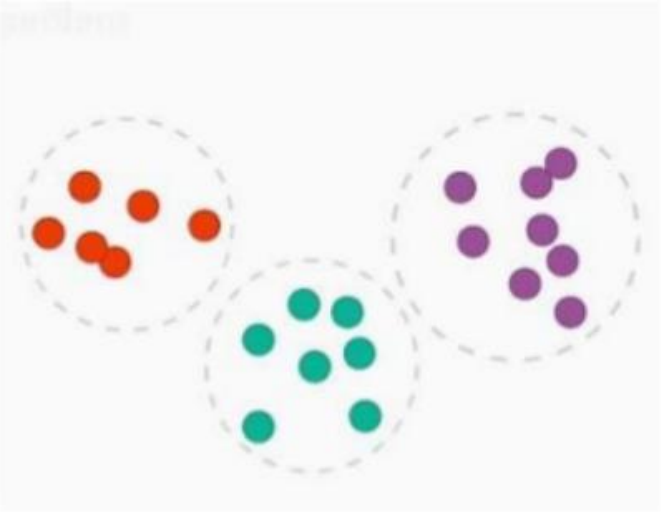


Classification

How much? How many?

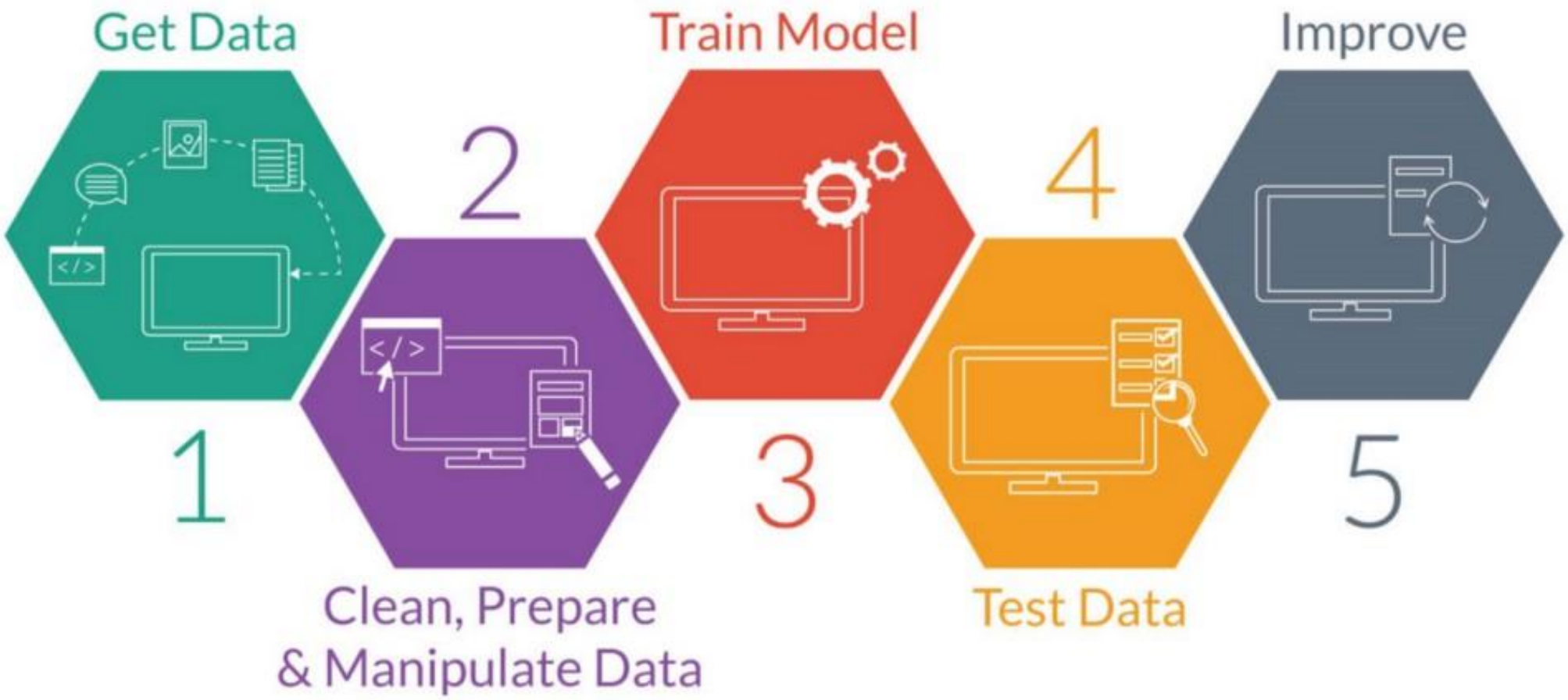
Regression

How is this organized?



Clustering

ML: Proceso de modelado



Niveles de conocimiento / Enfoques

Machine Learning Practitioner

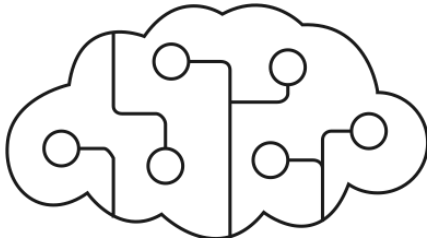
- Orientado a tareas.
- Realizar consultas sobre BDs.
- Limpieza de datos.
- Escribir scripts para transformar datos y probar algoritmos.
- Probar librerías.
- Hacer todo de una manera más fácil.
- Encontrar el mejor modelo para escribir código personalizado.

Machine Learning Research

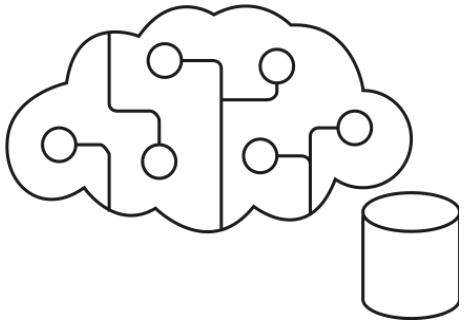
- Orientado a investigación.
- Leer papers.
- Implementar algoritmos desde cero.
- Traducir matemática en código.
- Mejorar algoritmos.
- Usar matemáticas para desarrollar los propios modelos.


amazon web services™
Google Cloud Platform
Azure
FLOYD
H2O.ai
IBM Watson™
fast.ai
scikit learn
mxnet
Keras
TensorFlow
RAPIDS
NumPy
Pandas
ONNX
PyTorch
DASK
Numba
OPTUNA
SciPy
OpenCV

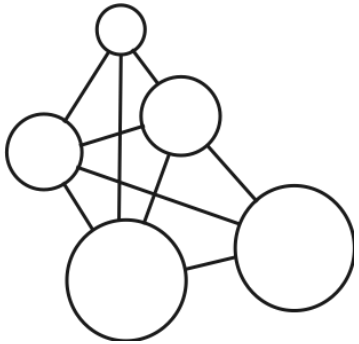
Opciones para desarrollar soluciones de IA



IA Pre-construida (Prebuilt)



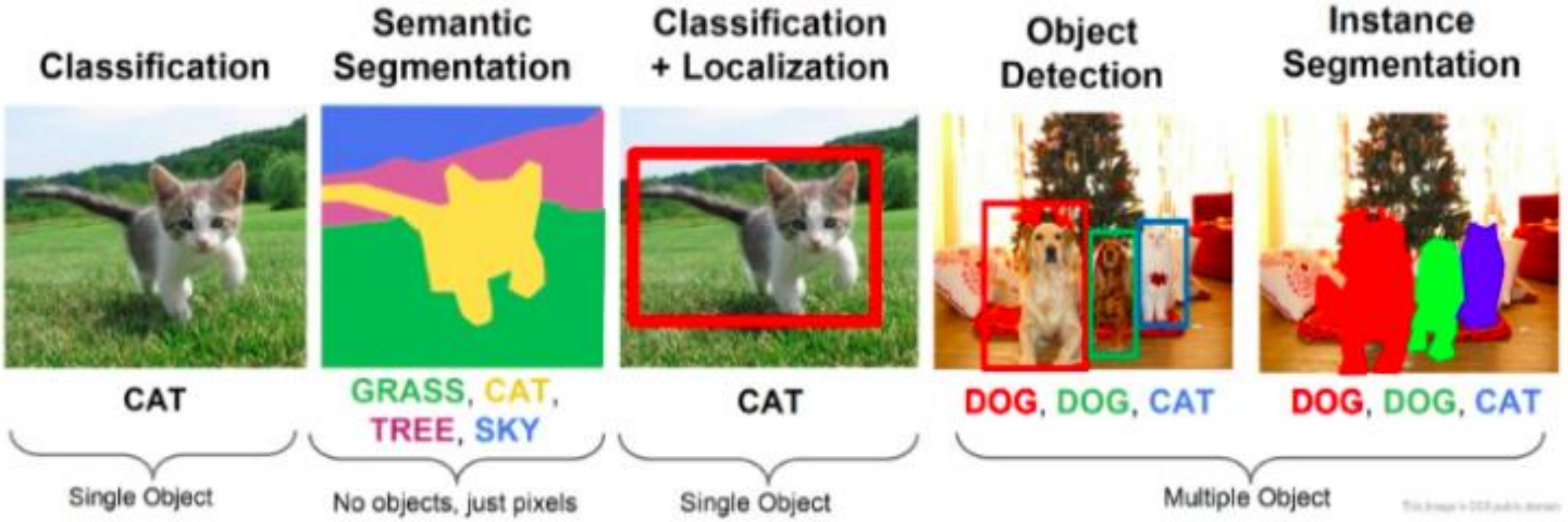
Personalizar la IA Pre-construida (Customize Prebuilt)



IA Personalizada (Custom)

Computer Vision

Computer Vision: Tareas



https://medium.com/@ODSC/using-the-cnn-architecture-in-image-processing-65b9eb032bdc

Computer Vision: Retos

Viewpoint Variation

Scale Variation

Background Clutter

Deformation

Occlusion Variation

Illumination Variation

Intra-class Variation

https://www.pyimagesearch.com/deep-learning-computer-vision-python-book/

Computer Vision: Proceso

Idea

Anotaciones

LabelImg

labelme

lb

Augmentations

imgaug

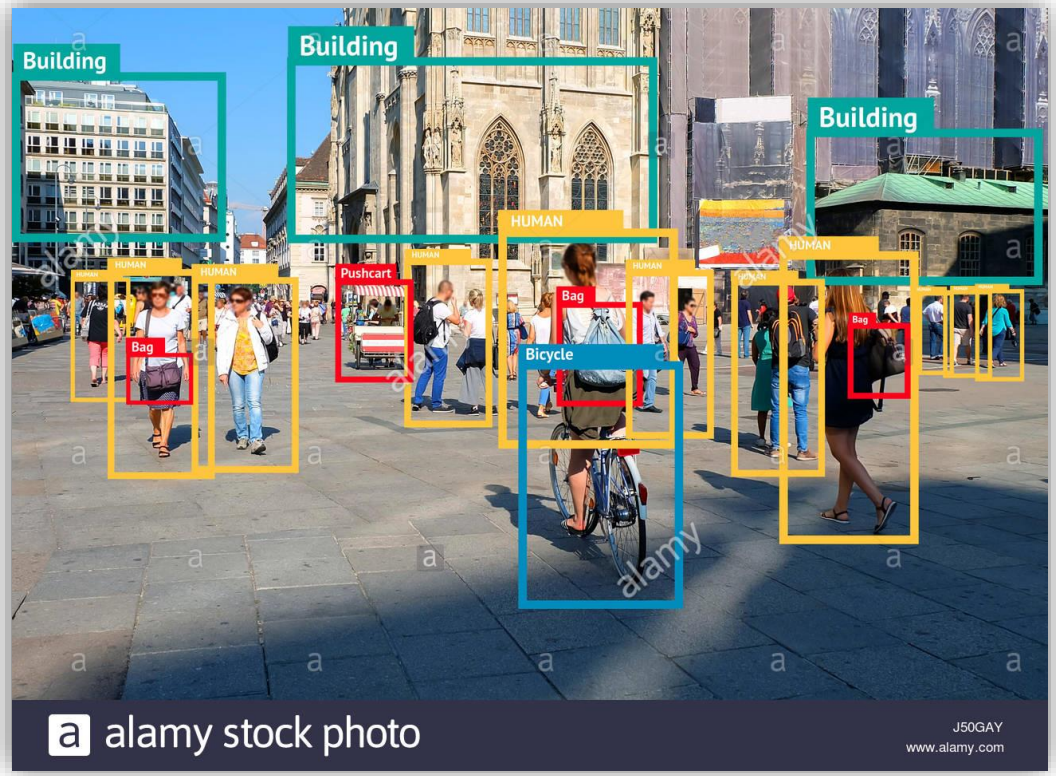
Entrenamiento de modelos

Visualización

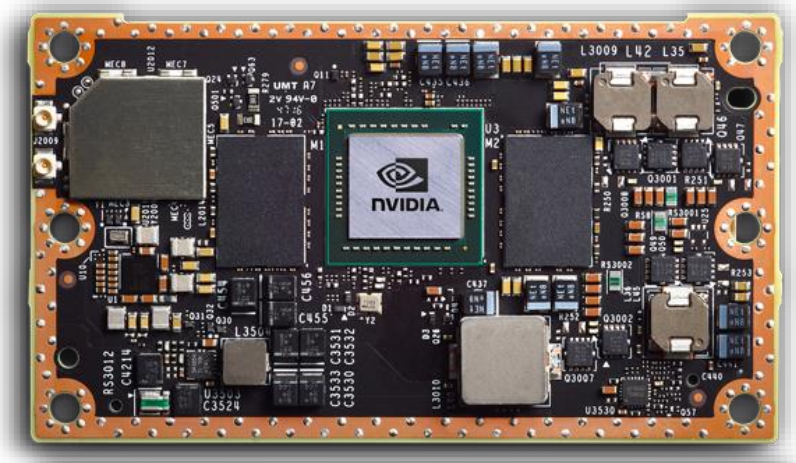
Prototipo

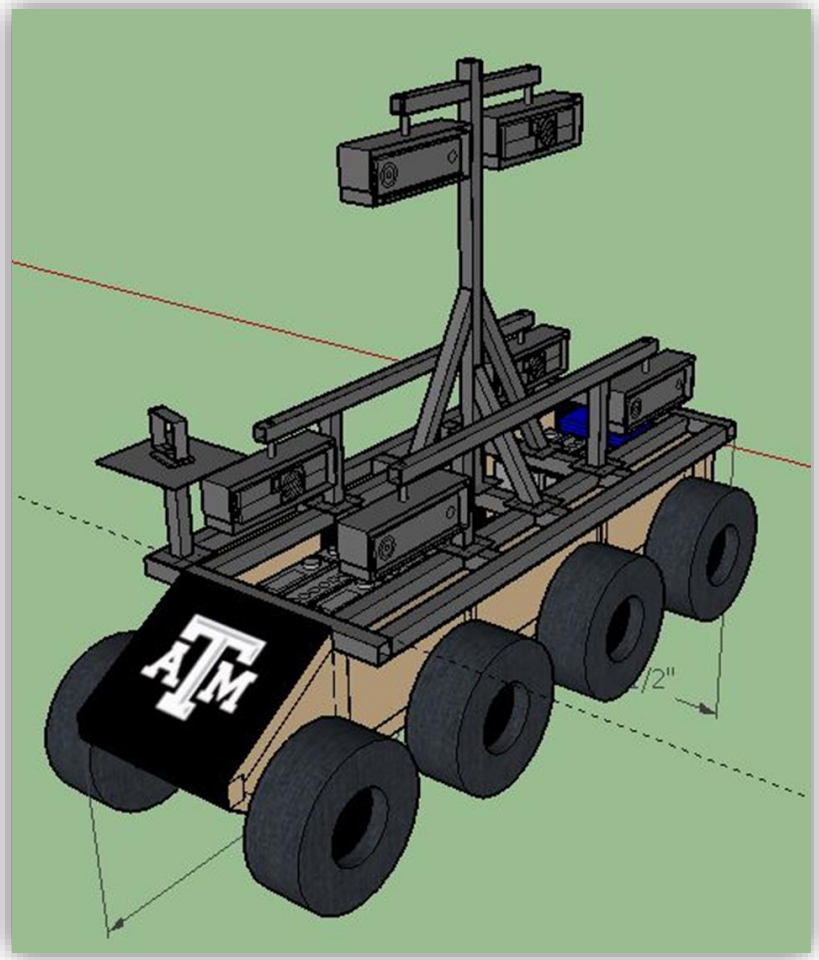
Computer Vision: Aplicaciones y Casos de Uso

Aplicaciones

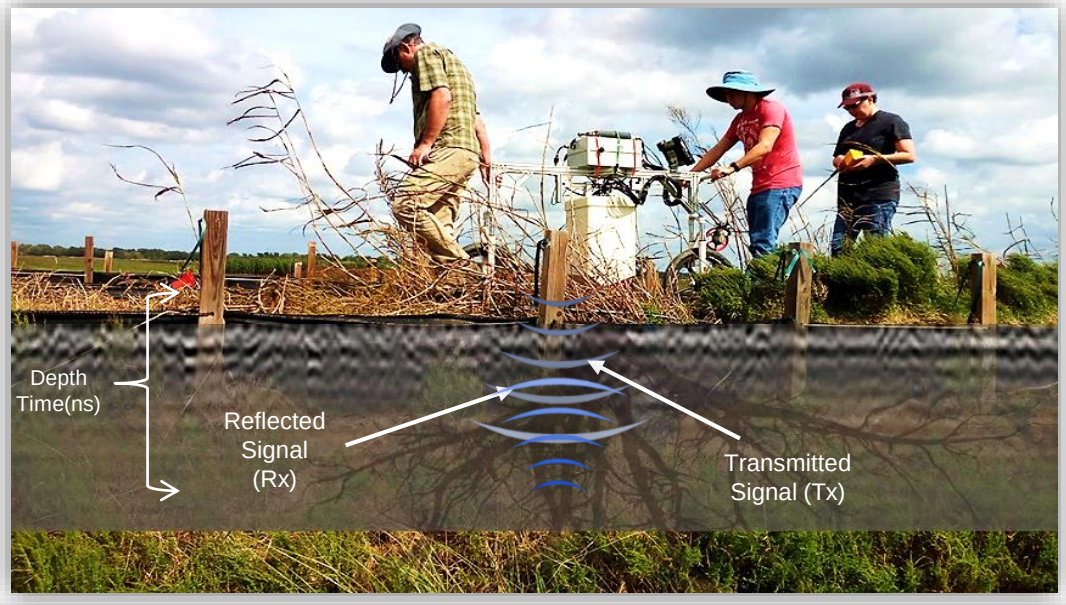


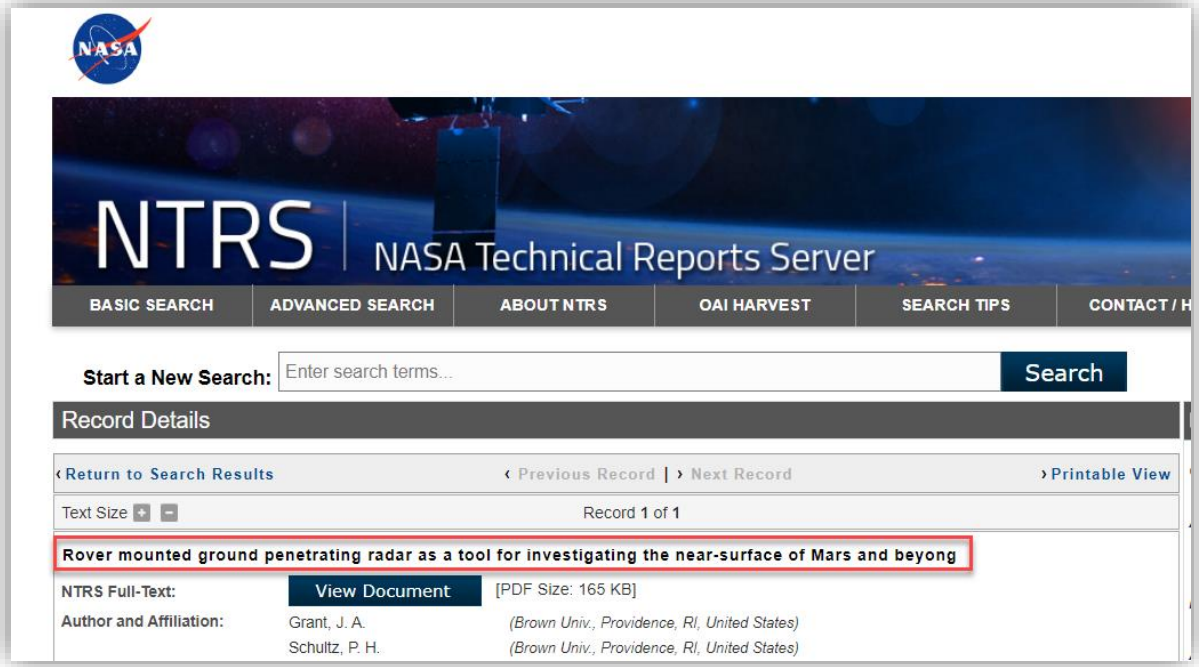
Project Scorpion





GPR for roots phenotyping





Tumaini

Tumaini (acceso anticipado)

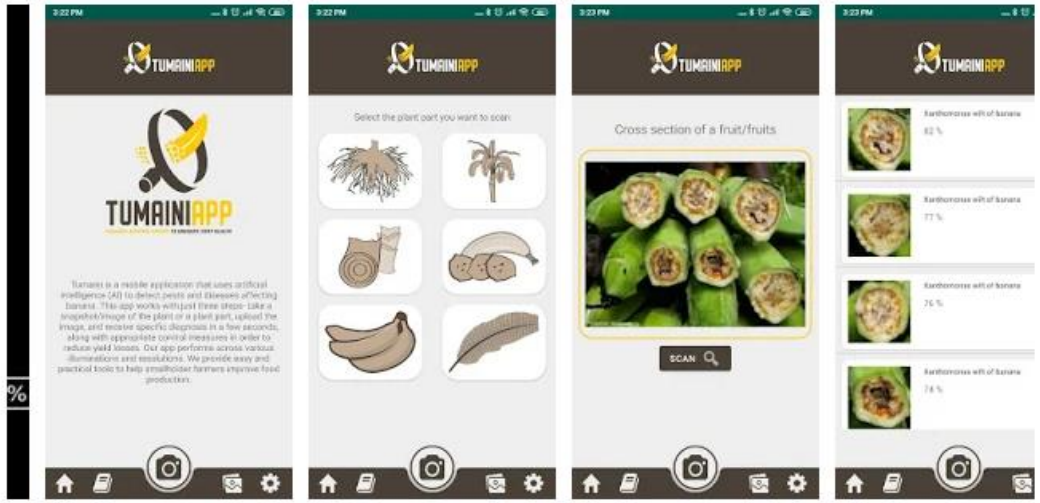
CIAT Herramientas

Para todos

Esta aplicación está en desarrollo y puede ser inestable.

Esta aplicación es compatible con todos tus dispositivos.

Instalada



Plant Methods
December 2019, 15:92 | Cite as

AI-powered banana diseases and pest detection

Authors Authors and affiliations

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Open Access | Research
First Online: 12 August 2019

Abstract

Background

Banana (*Musa* spp.) is the most popular marketable fruit crop grown all over the world, and a dominant staple food in many developing countries. Worldwide, banana production is affected by numerous diseases and pests. Novel and rapid methods for the timely detection of pests and

Proyectos Open Source

Proyectos Open Source

A graphical annotation tool to address different Computer Vision tasks.

An open-source Python library that offers developers an interface to interact with some of the most popular computer vision frameworks, such as TensorFlow Object detection API and Detectron.

React.js application, that takes the keypoints generated by the face-mesh and Pose Net tensorflow.js model, then map the movement into a 3d model

DEMO: DL4CV End-to-End Project

DEMO

Idea	• Detectar trenes y aviones • Tarea: **Object** Segmentation
Anotaciones	• Obtener datos (FalconCV) • Realizar anotaciones (CVStudio)
Entrenamiento	• Realizar entrenamiento de varios modelos (FalconCV)
Visualizar resultados	• Ver resultados de entrenamiento (FalconCV)
Prototipo	• Generar versión de mejor modelo (FalconCV)

https://github.com/dloperab/calisharp-demo-e2e-dl4cv

Comentarios y Preguntas

Gracias!

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David Lopera