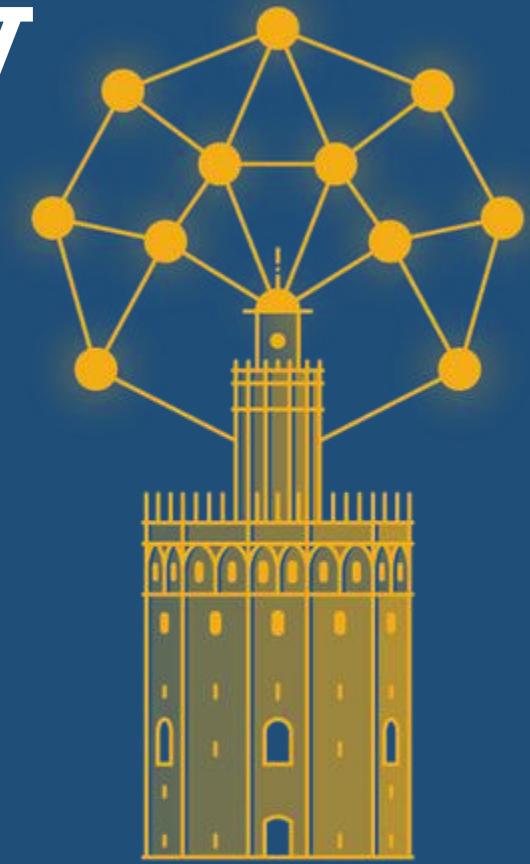


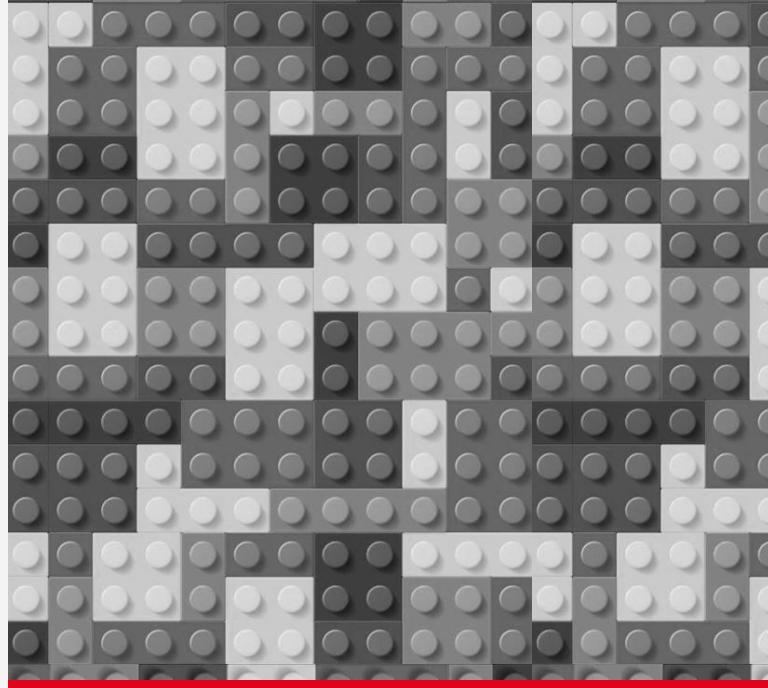
reconocer y  
contar

---

LEGO

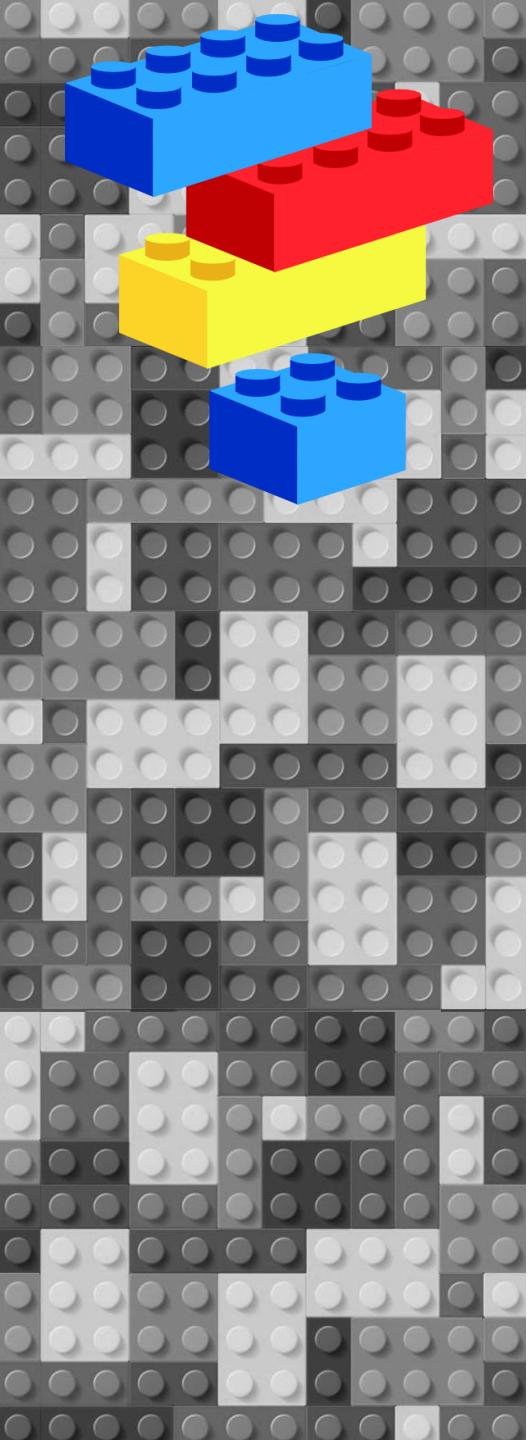
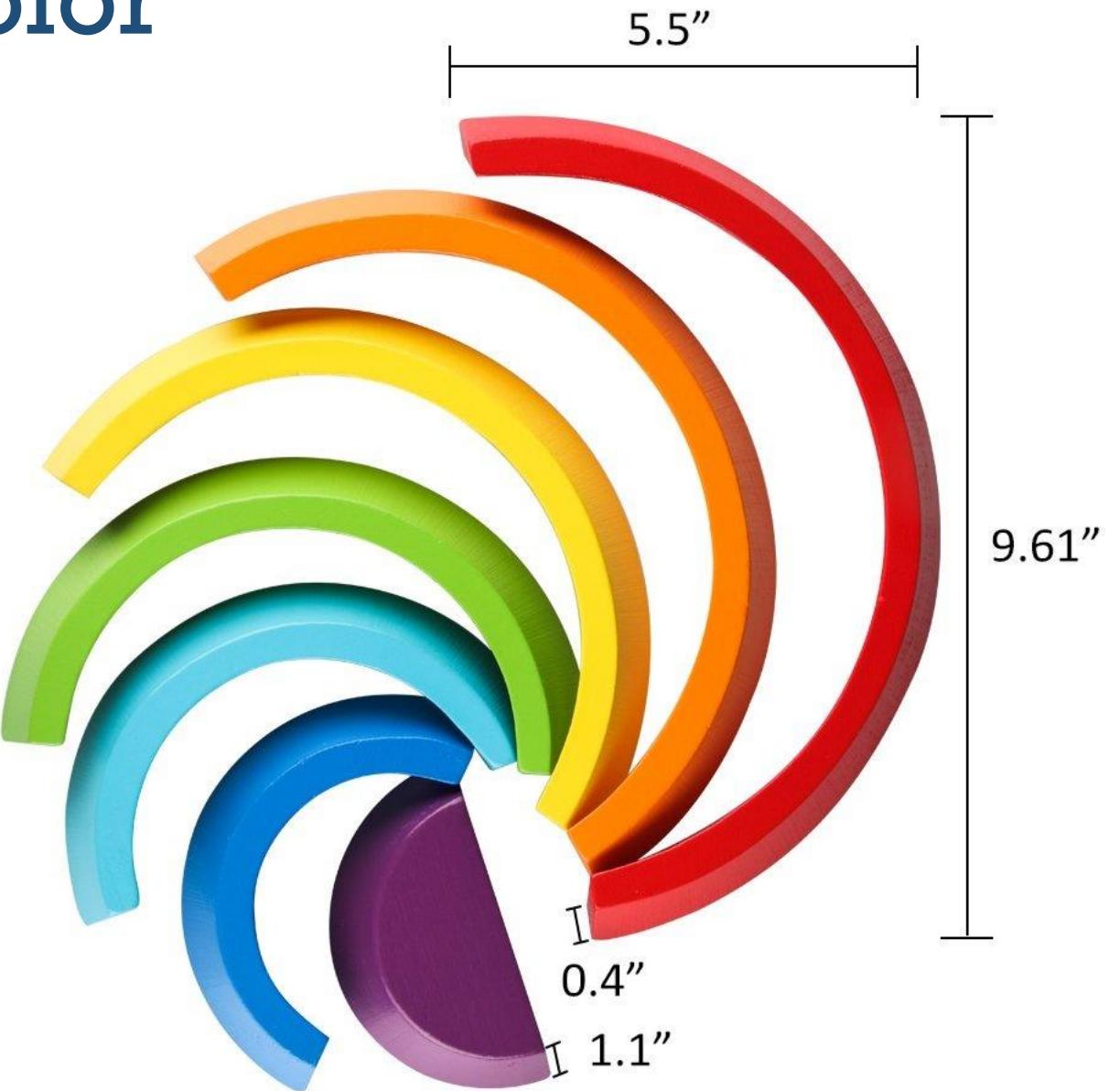


AI Saturdays  
Sevilla

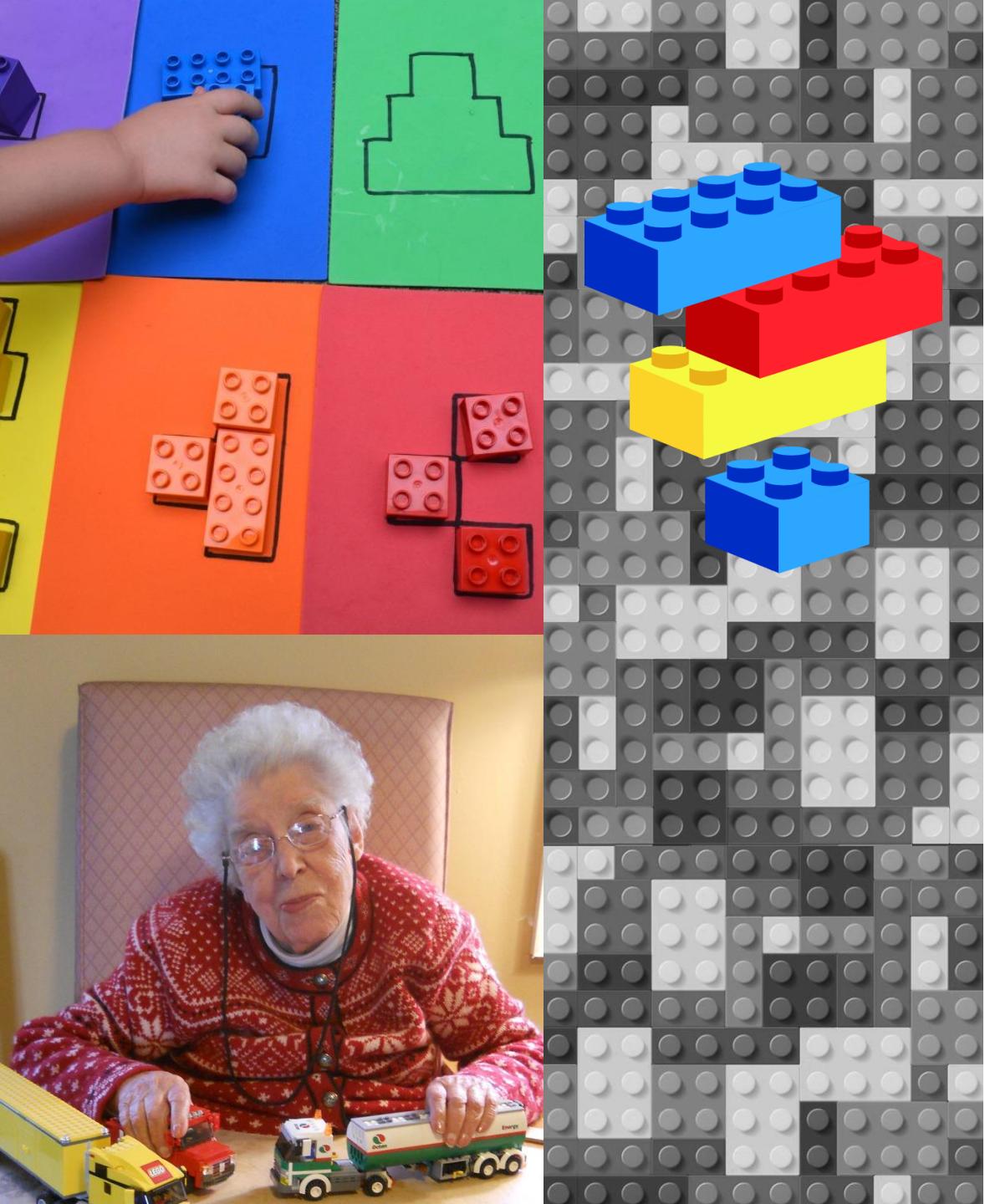
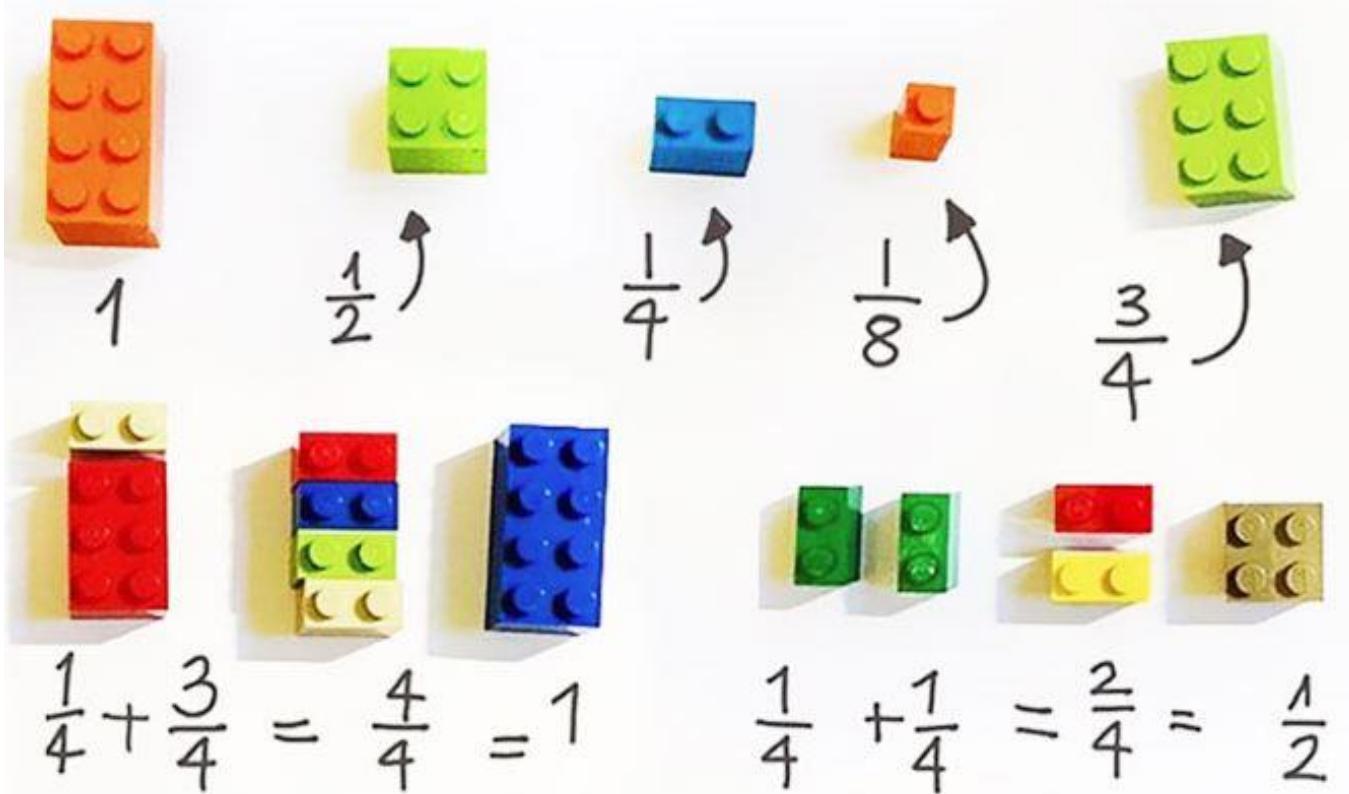


**Lego is short  
for "Leg godt",  
which means  
play good!**

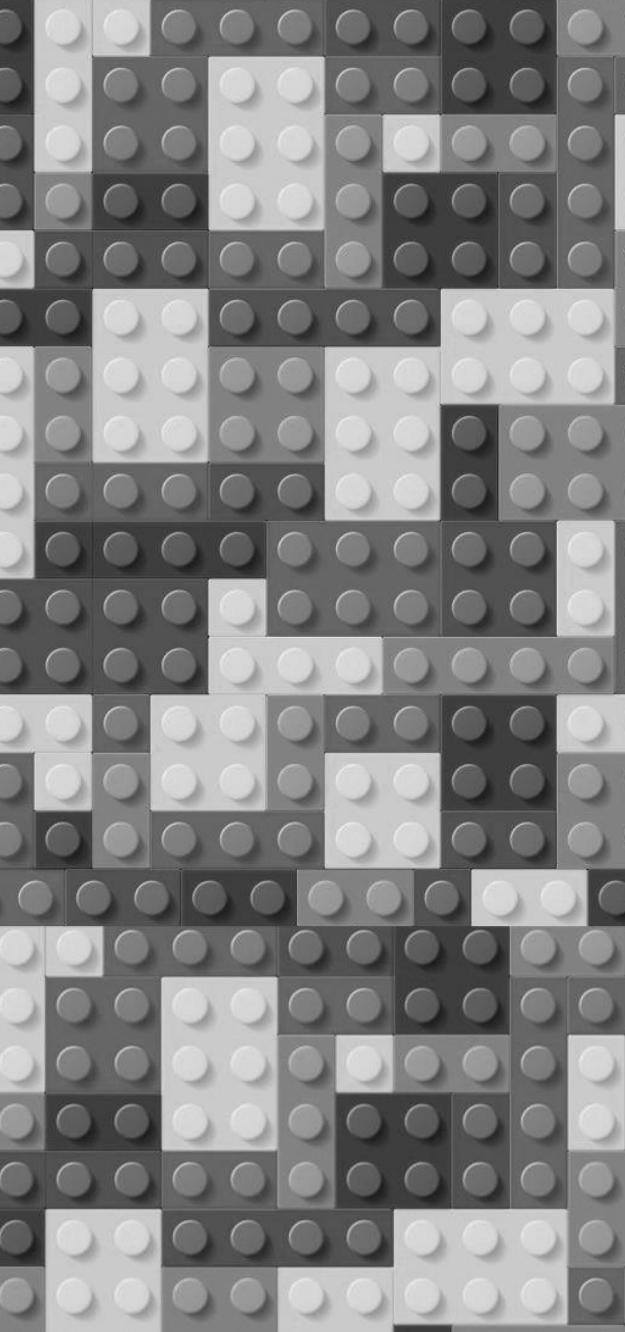
# forma y color



# todas las edades

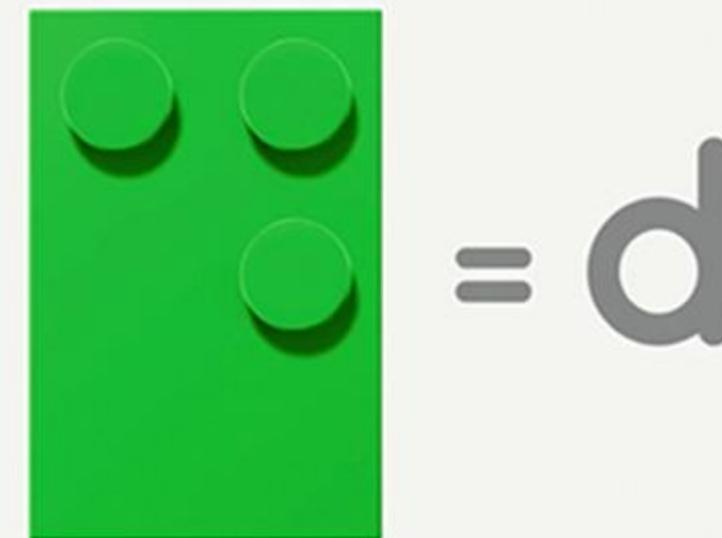


llegar a todos, con  
el menor coste  
para el planeta



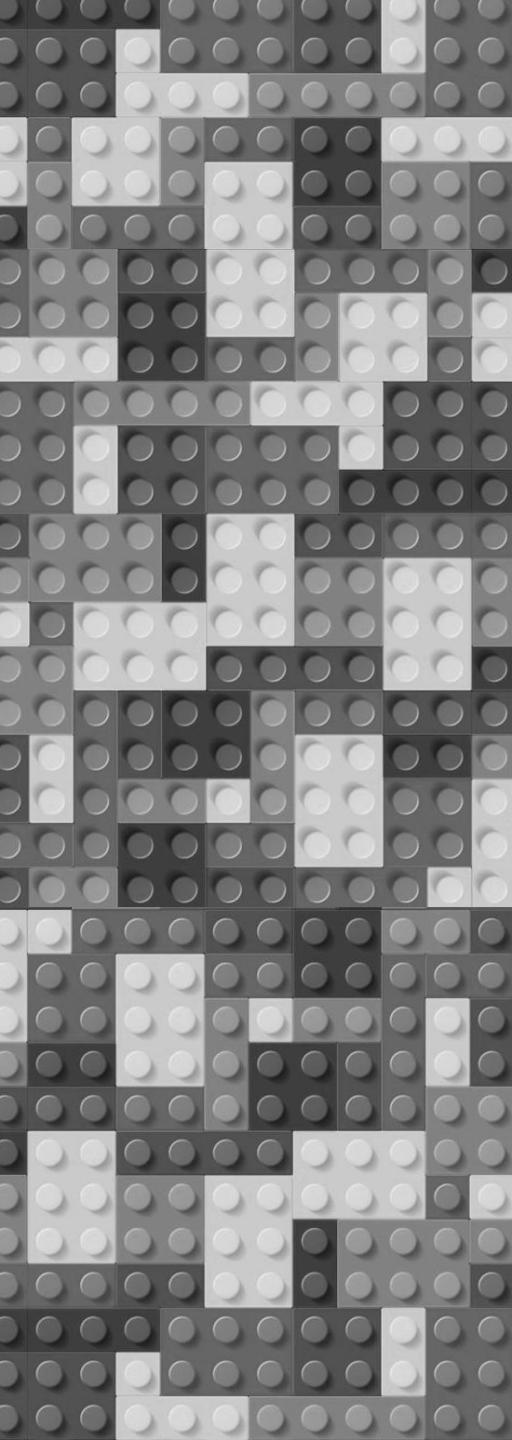


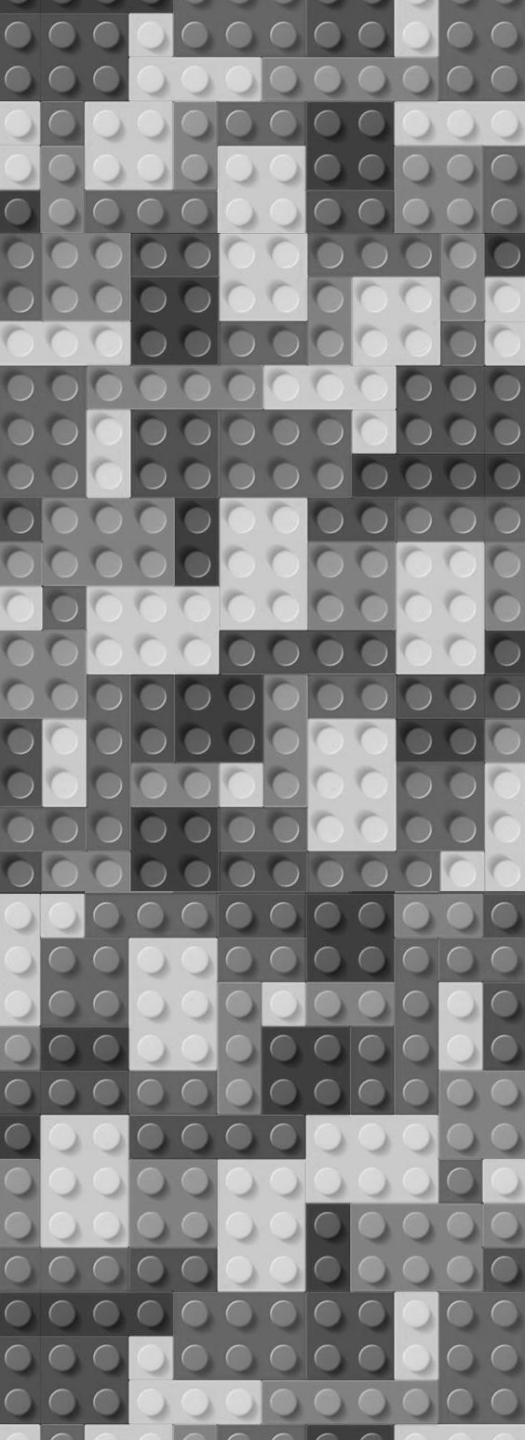
Hemos dicho:  
A TODOS



objetivos

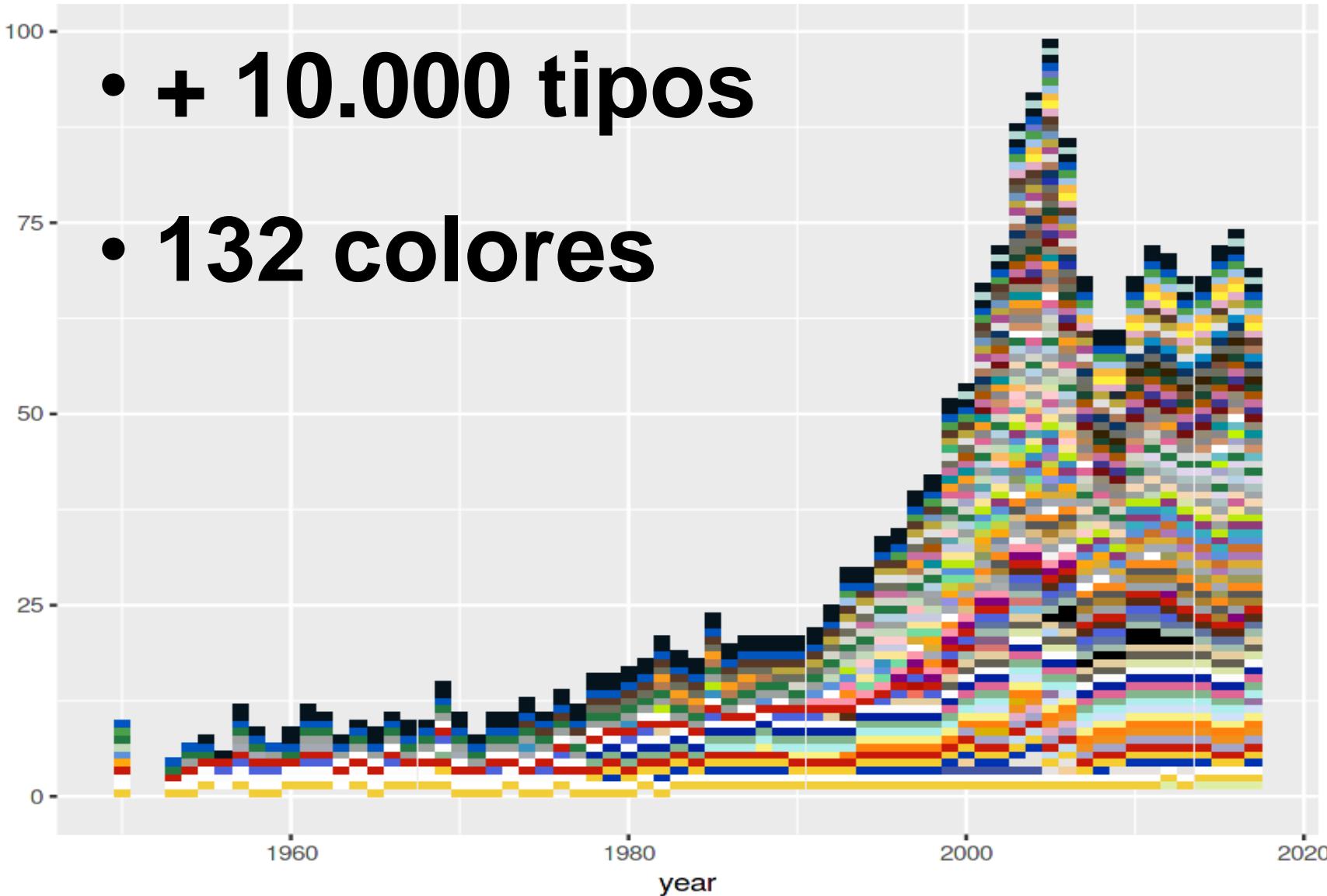
compartirlo





# algunos datos

- + 10.000 tipos
- 132 colores

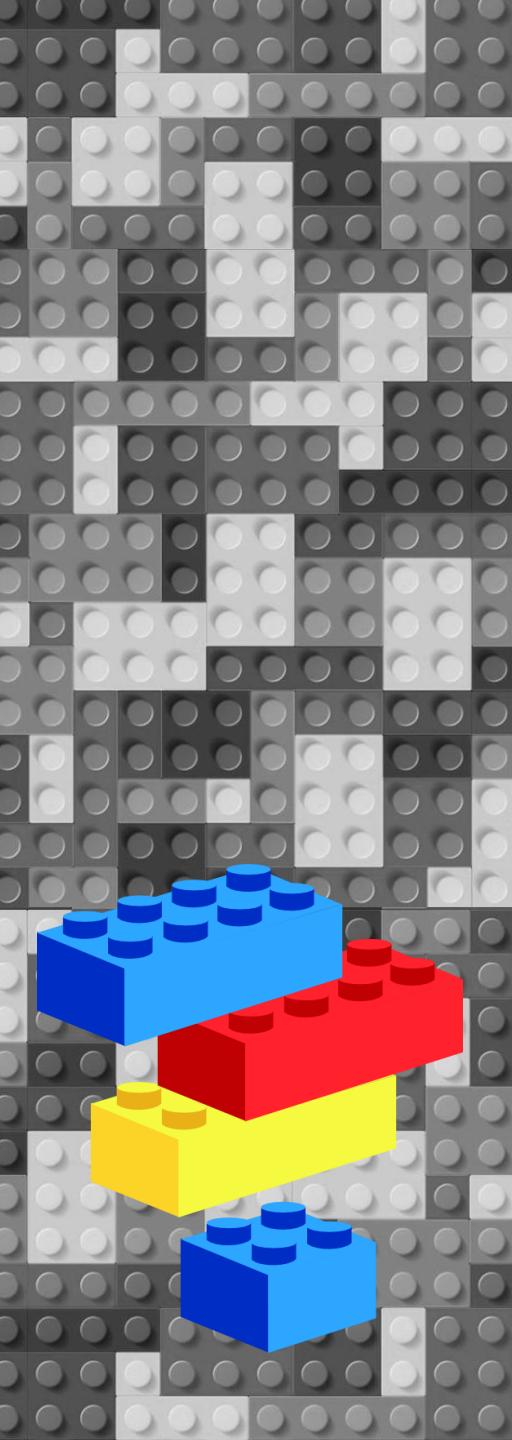


core



reconocer

contar

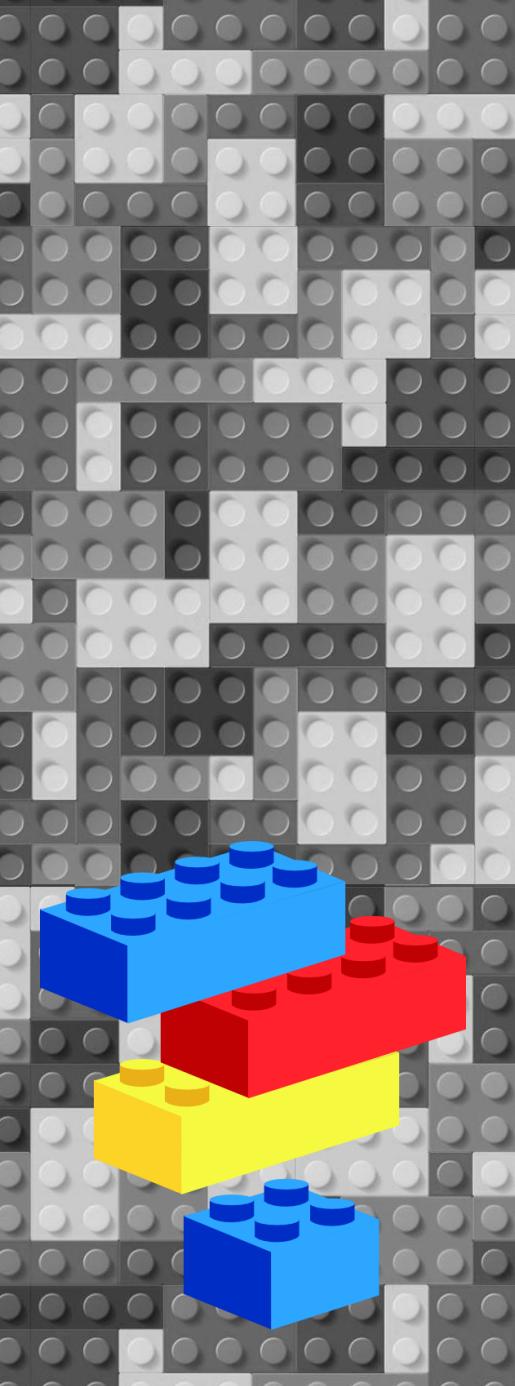


reconocer



10:00 - 1 abr. 2019

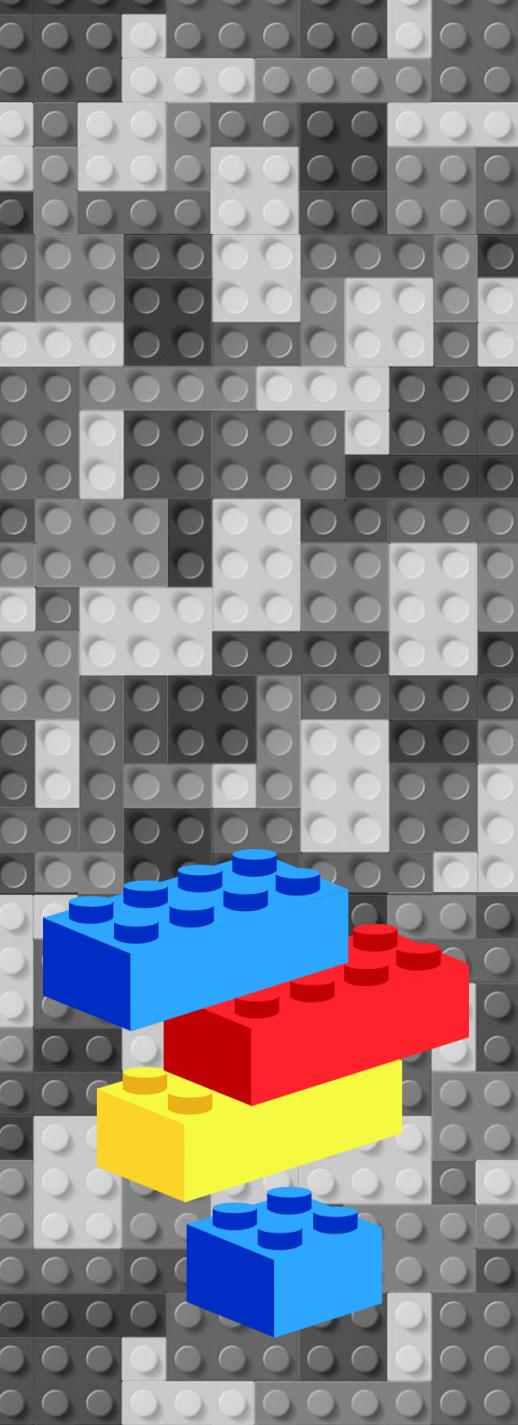
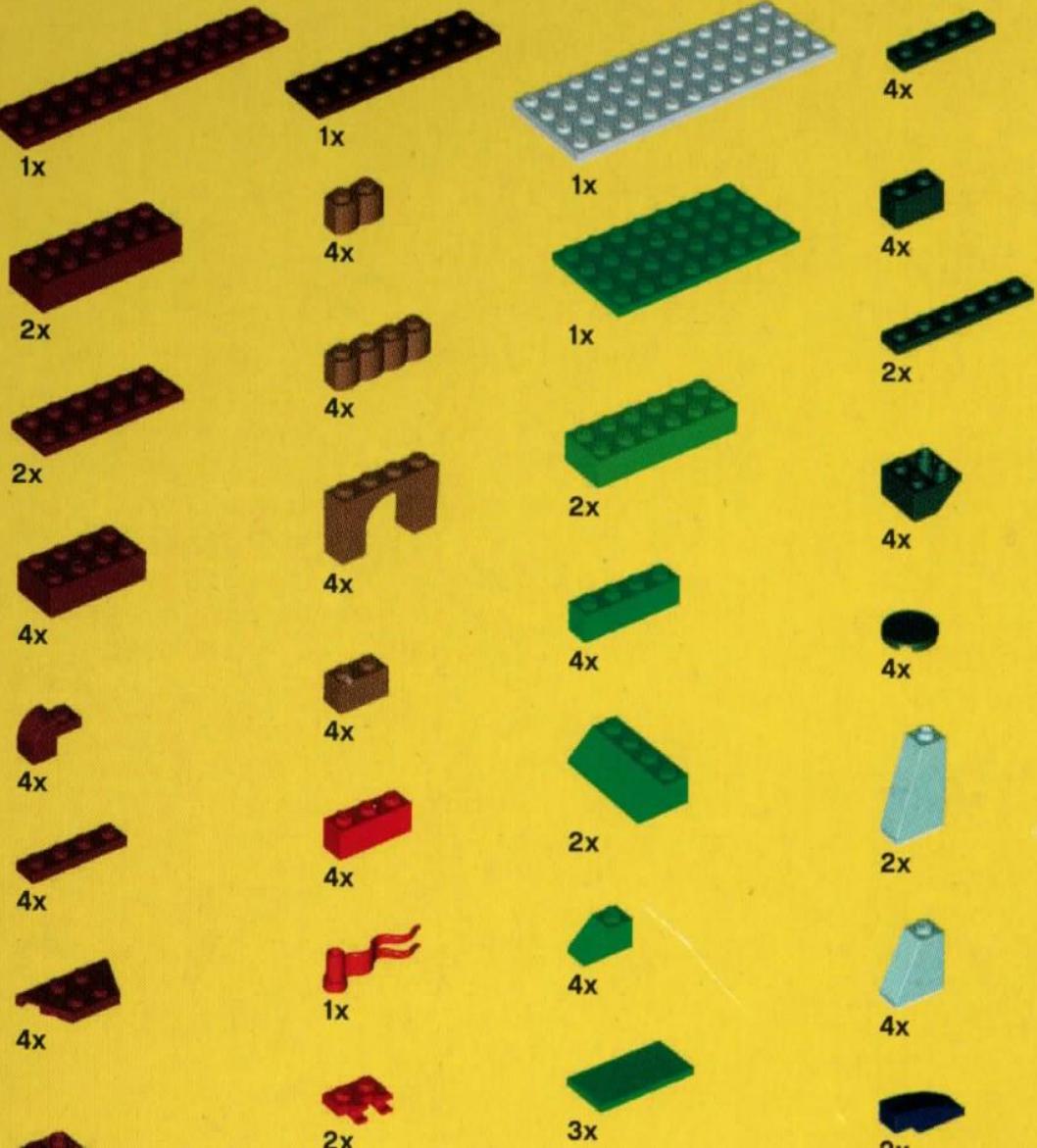
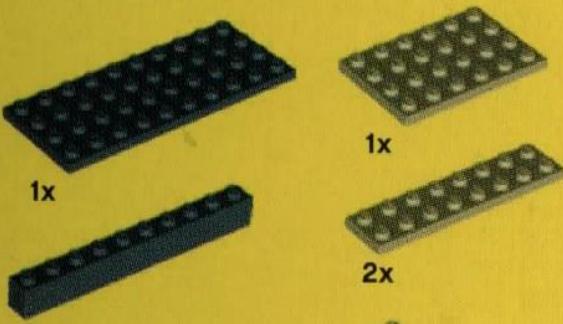
1.413 Retweets 6.012 Me gusta



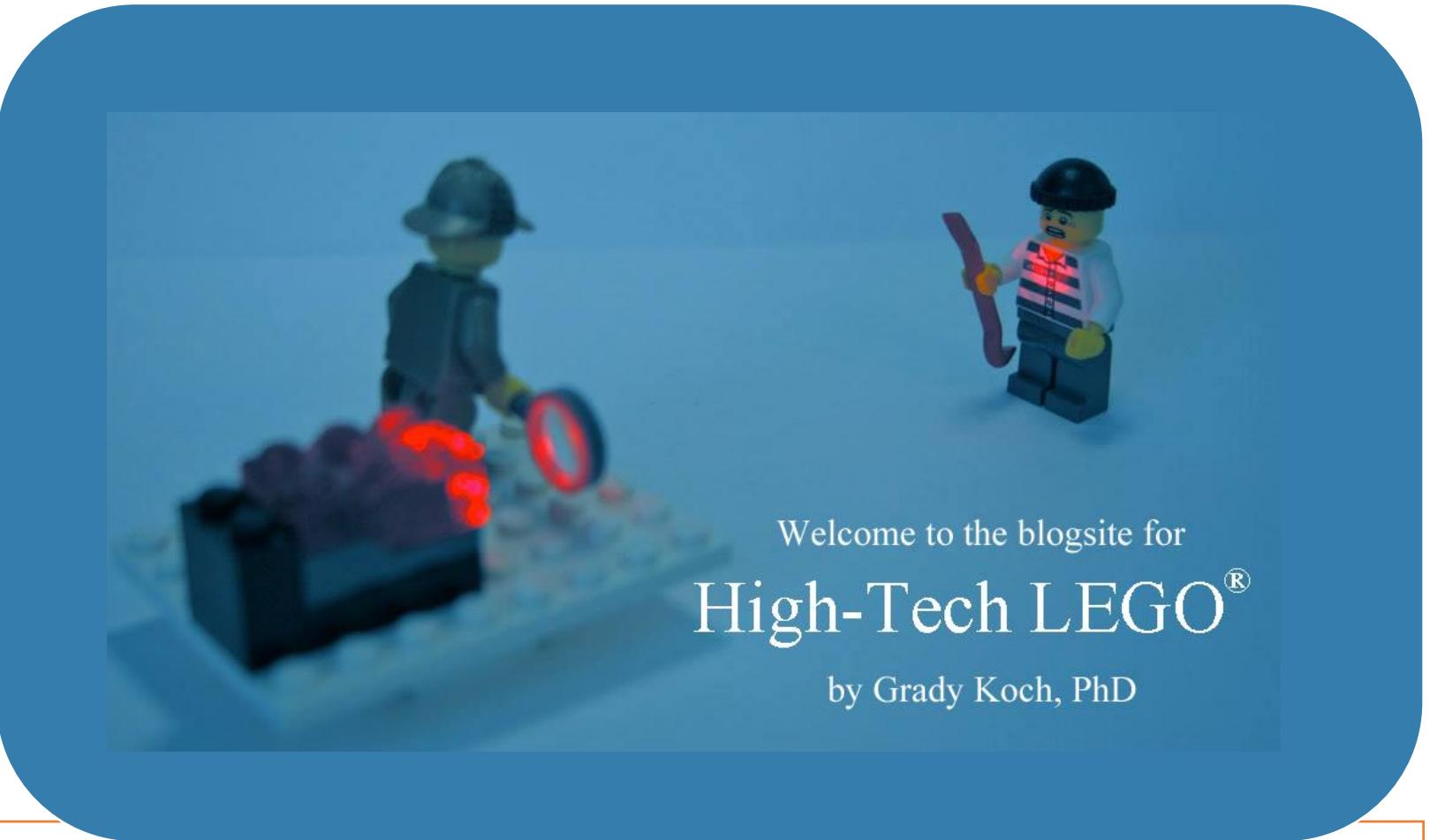
# contar



**10704**

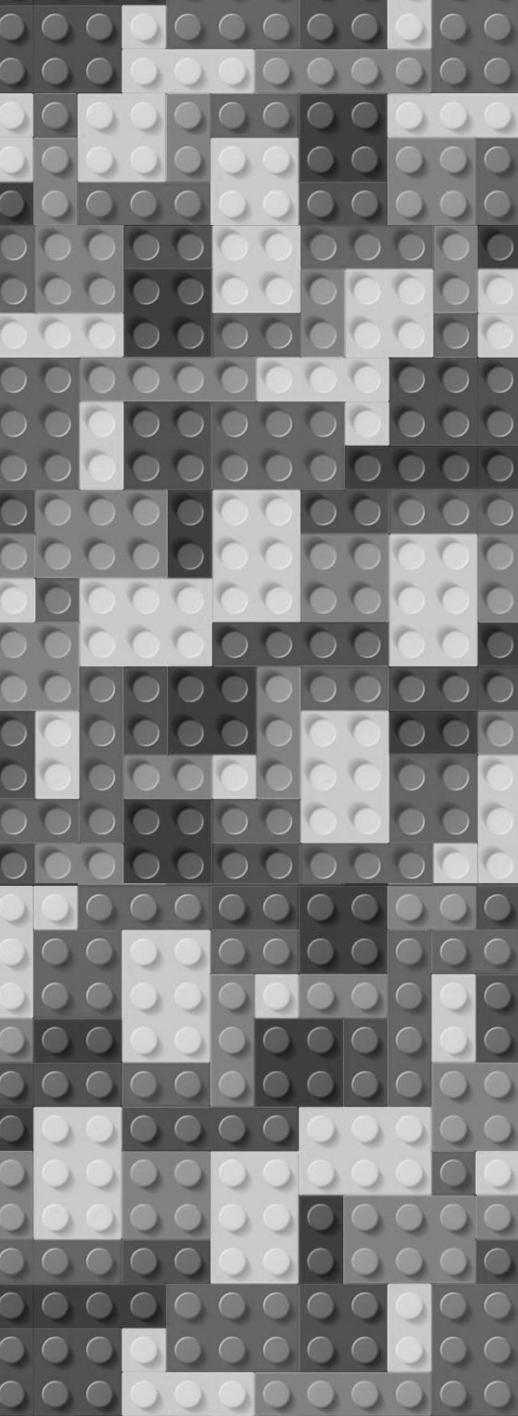


# técnicas – nube de puntos

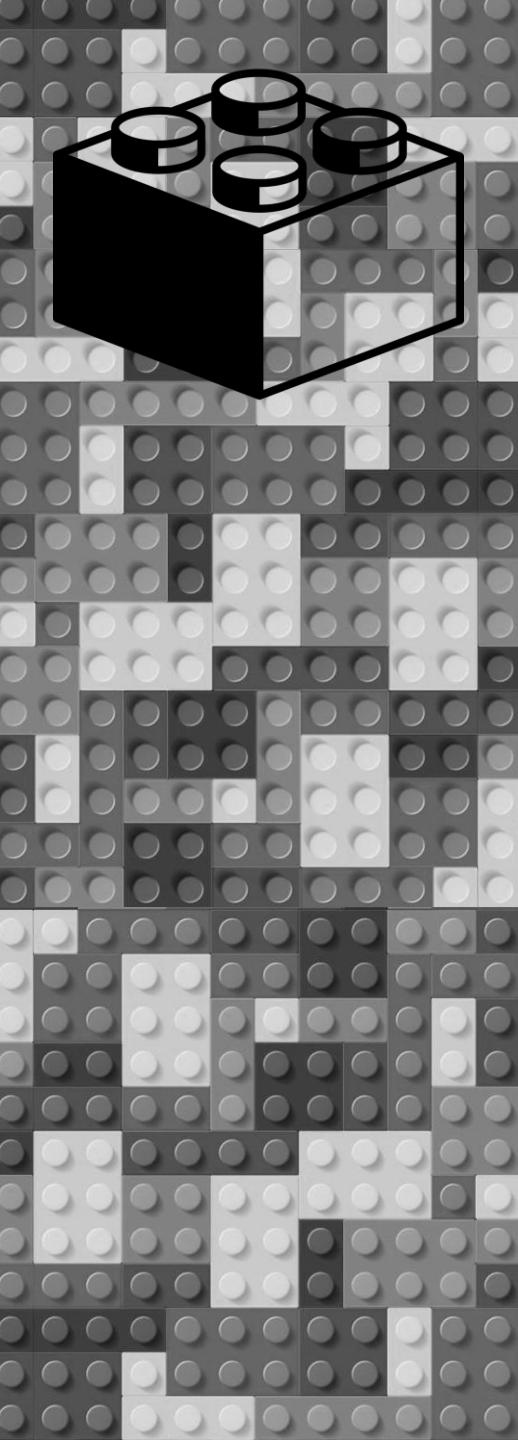
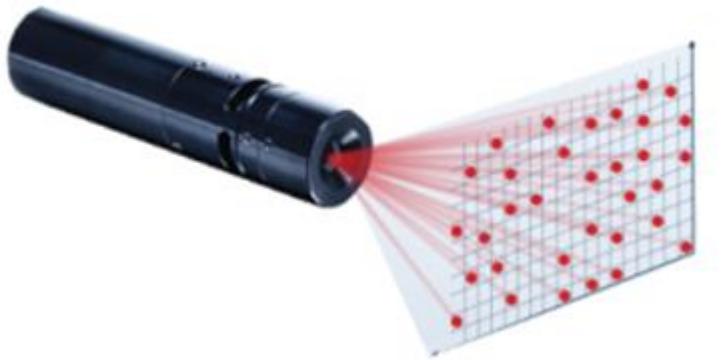
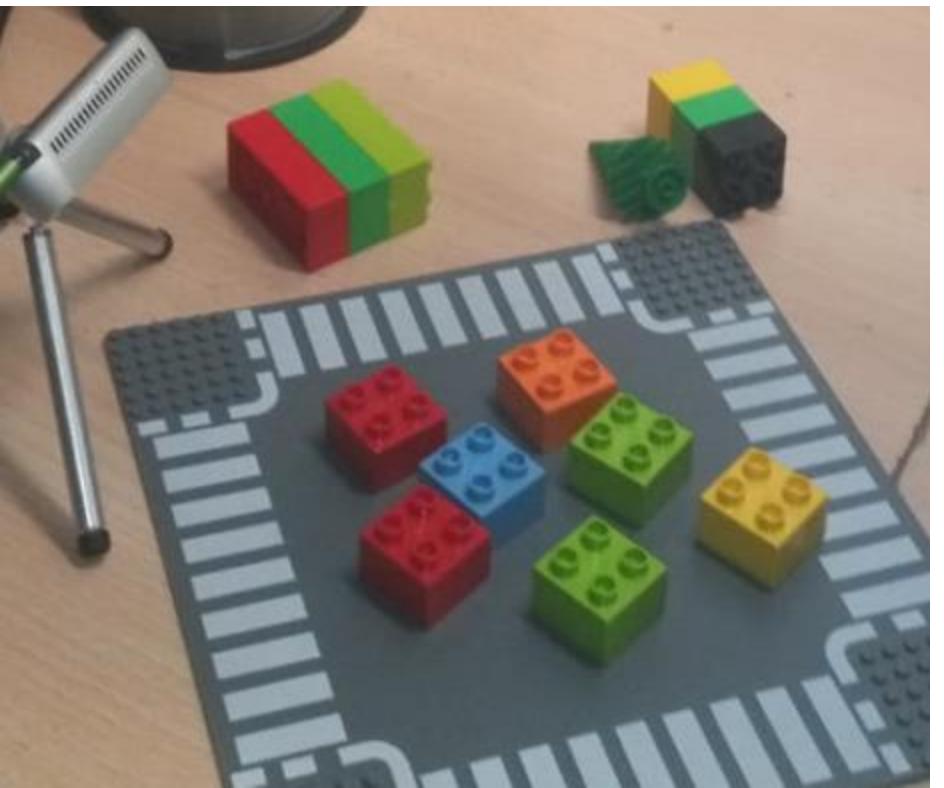


Welcome to the blogsite for  
**High-Tech LEGO®**

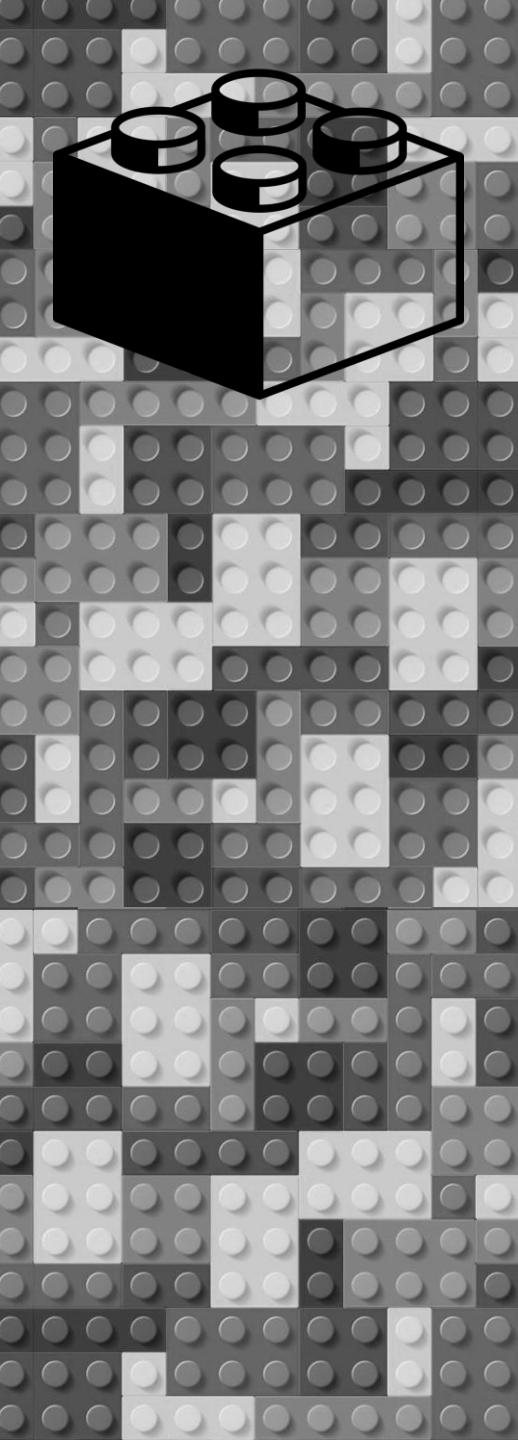
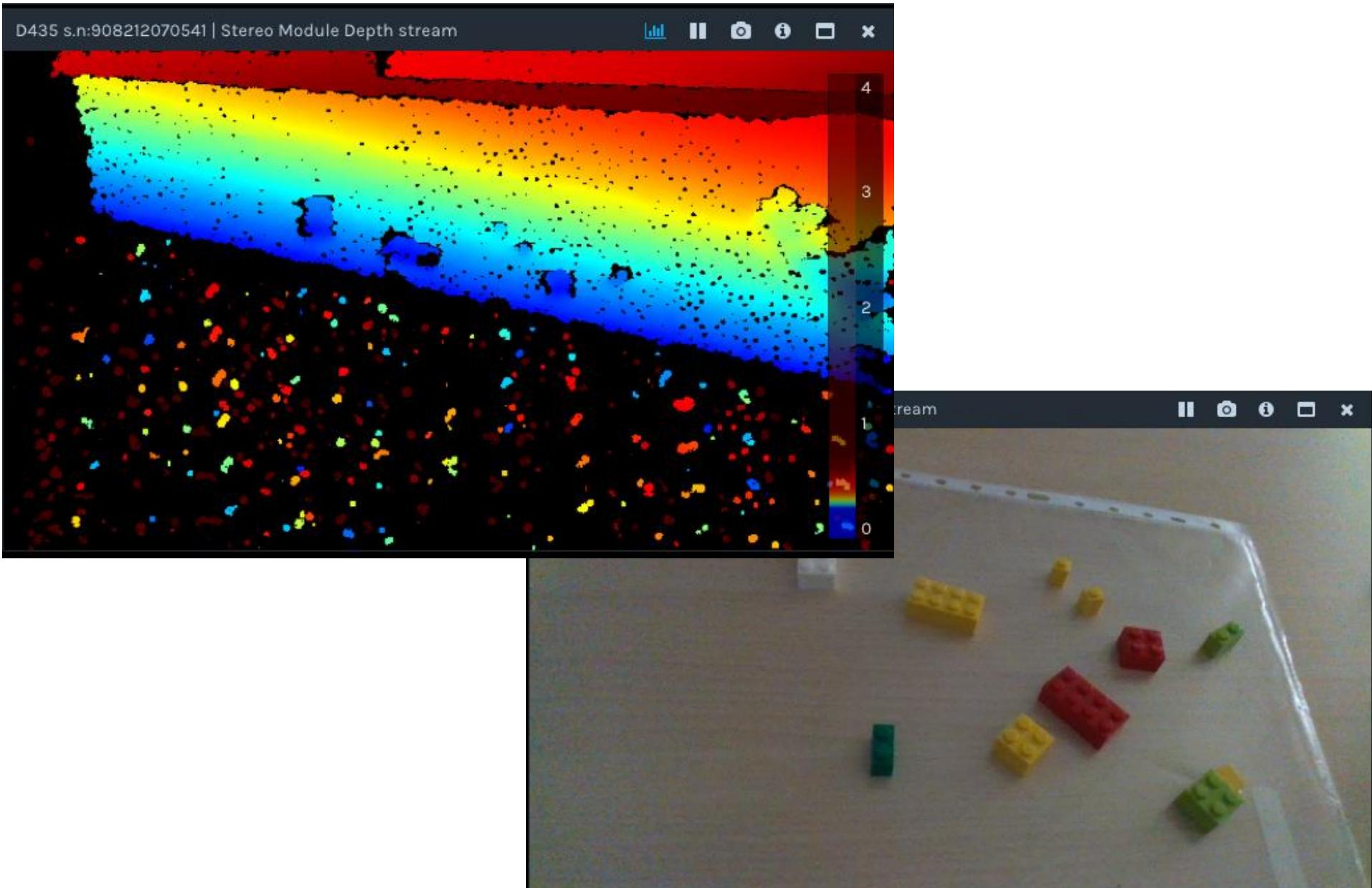
by Grady Koch, PhD



# técnicas - nube de puntos



# técnicas - nube de puntos



# técnicas - imagen



Classification	Base Training Set	Classifier Model	Final Trained Accuracy
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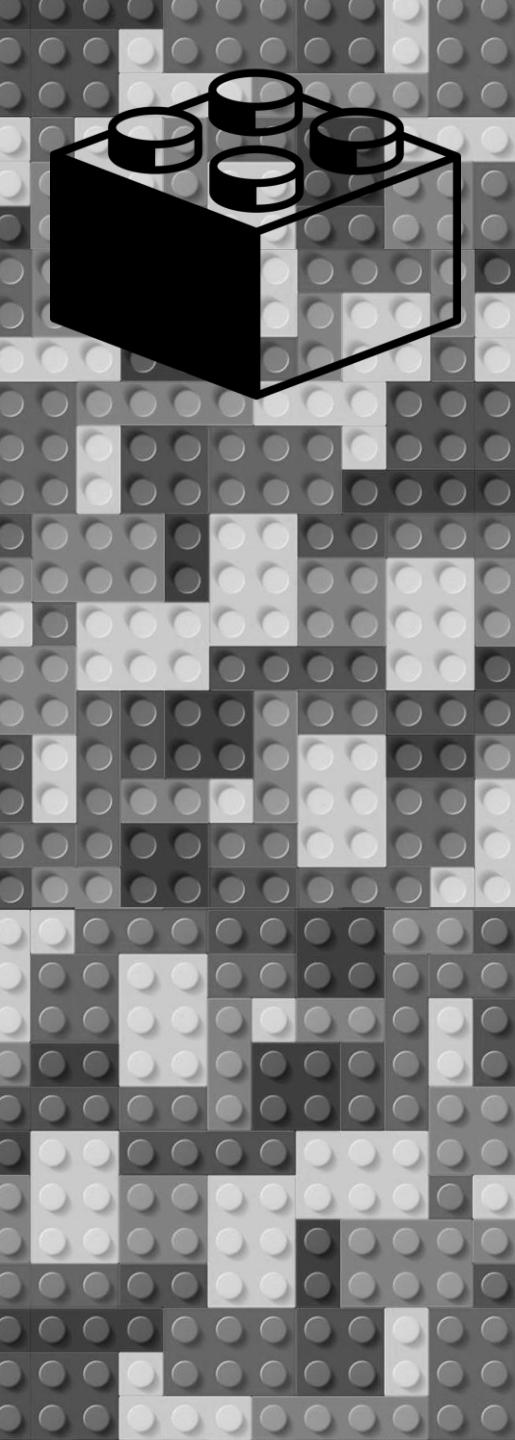
11 Brick Types

2,300 images

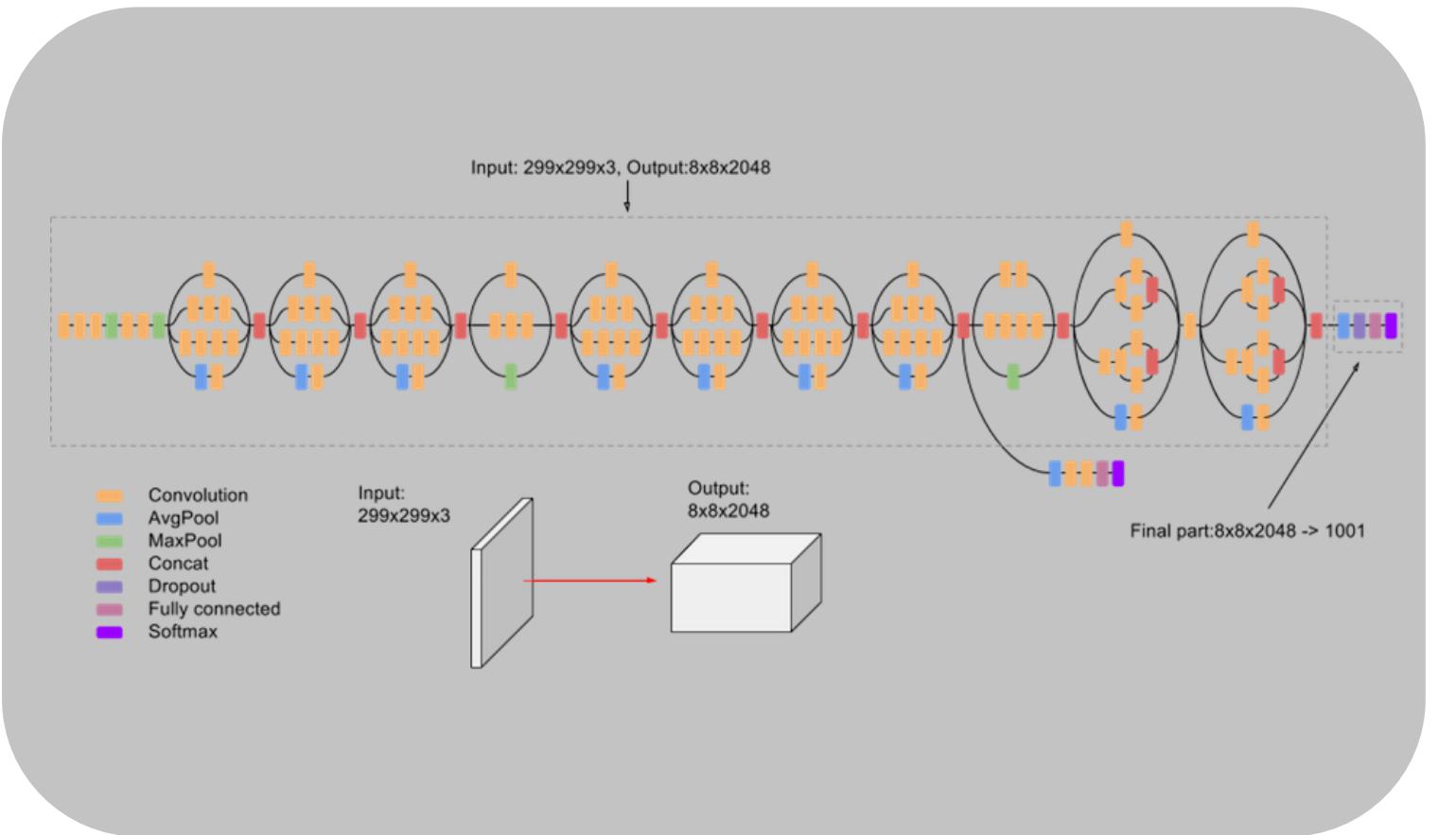
Inception V3

96.7%

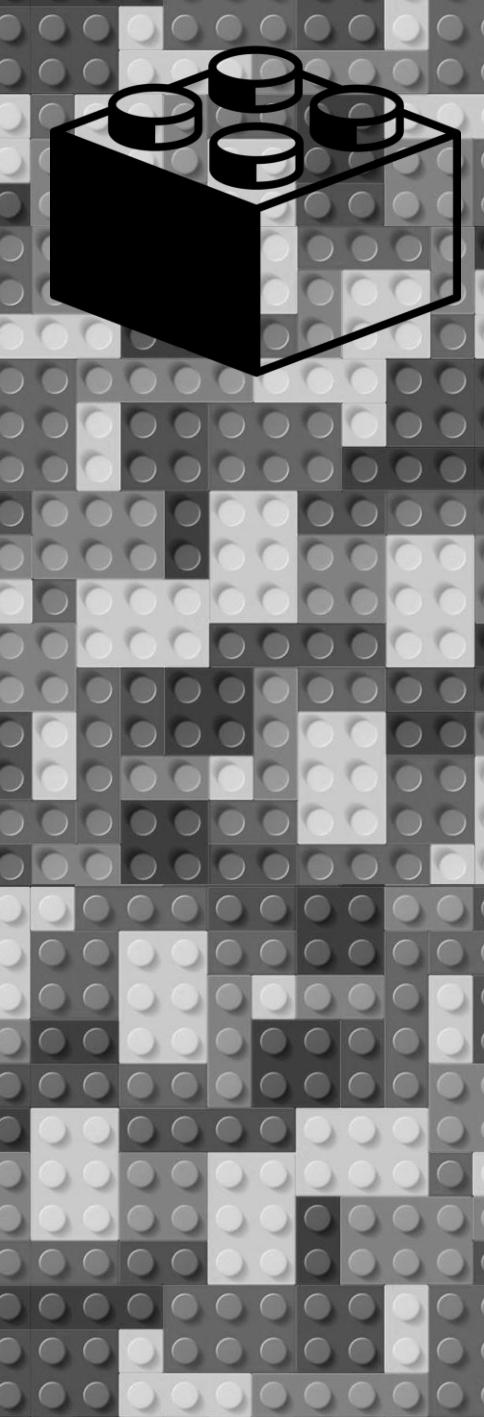
@pacogarcia3



# técnicas - imagen



@pacogarcia3

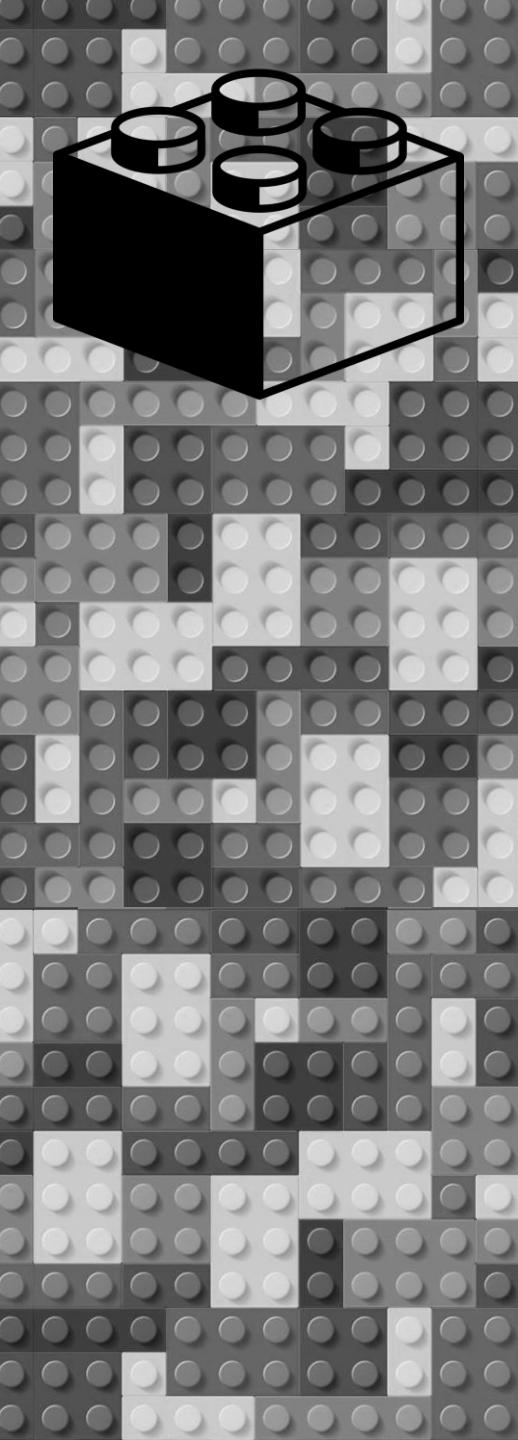


# técnicas - imagen

Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks

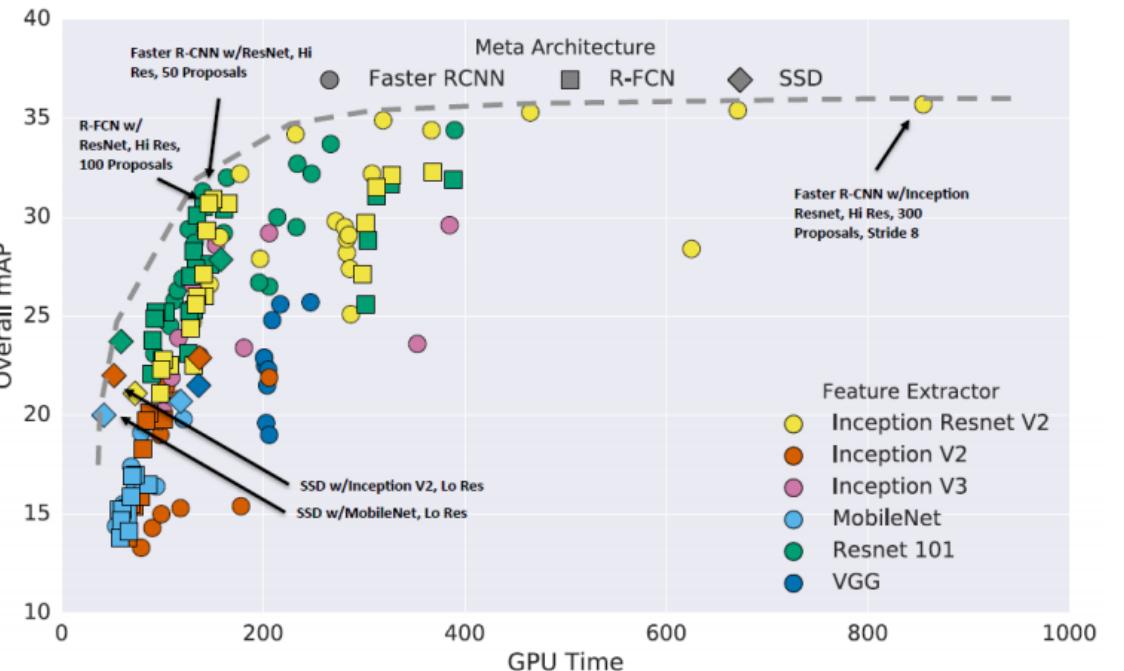
Shaoqing Ren, Kaiming He, Ross Girshick, Jian Sun

<https://arxiv.org/abs/1506.01497>

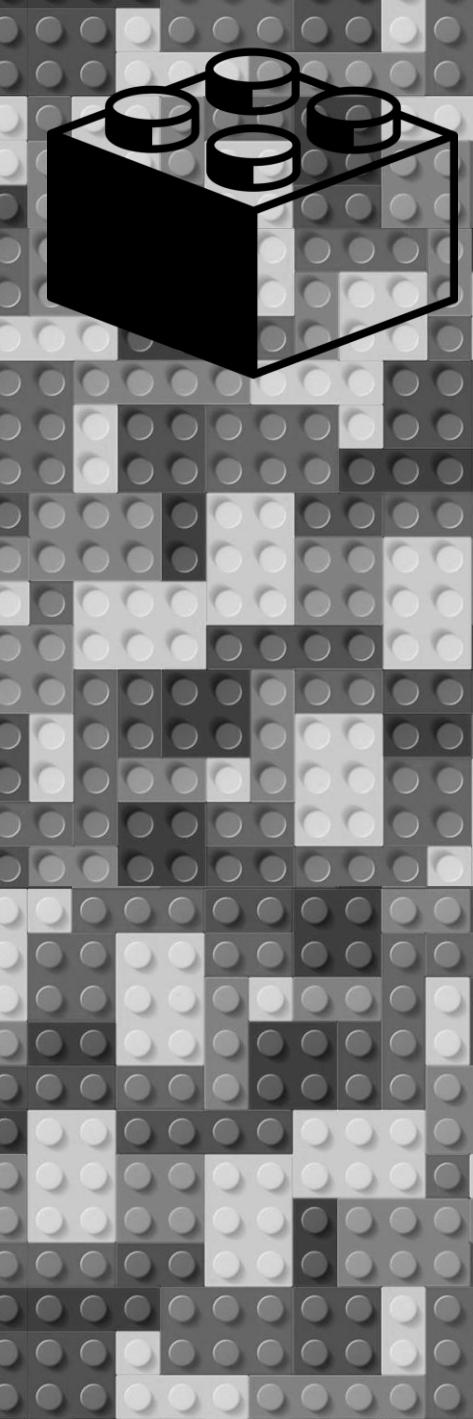
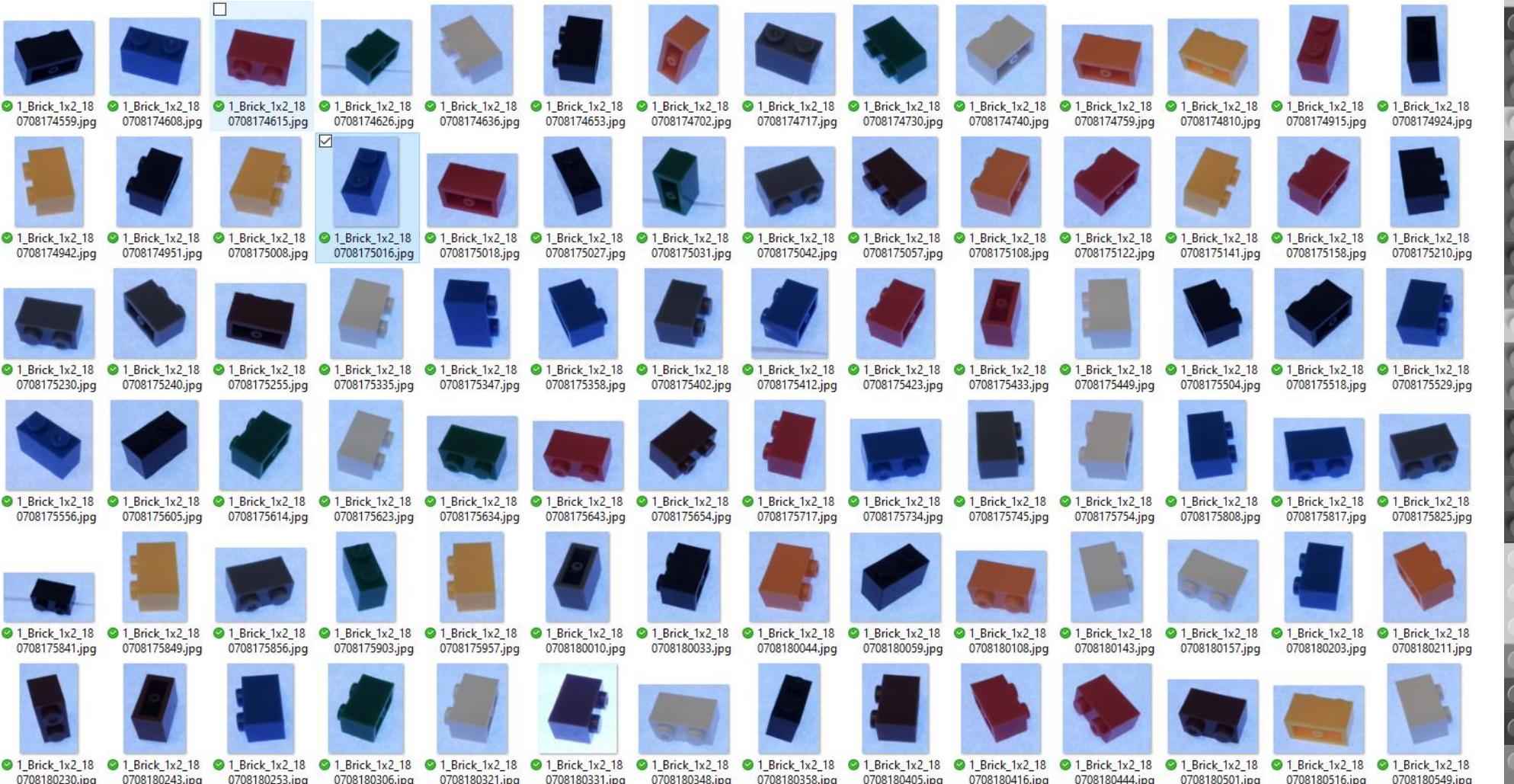


## Is Faster R-CNN Really Fast?

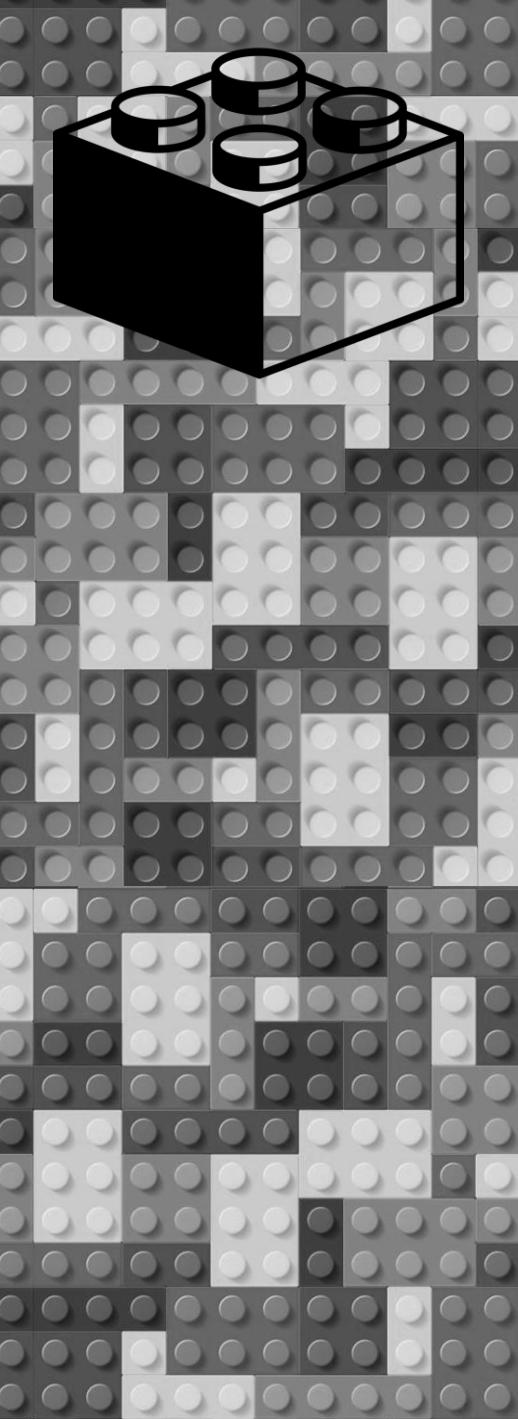
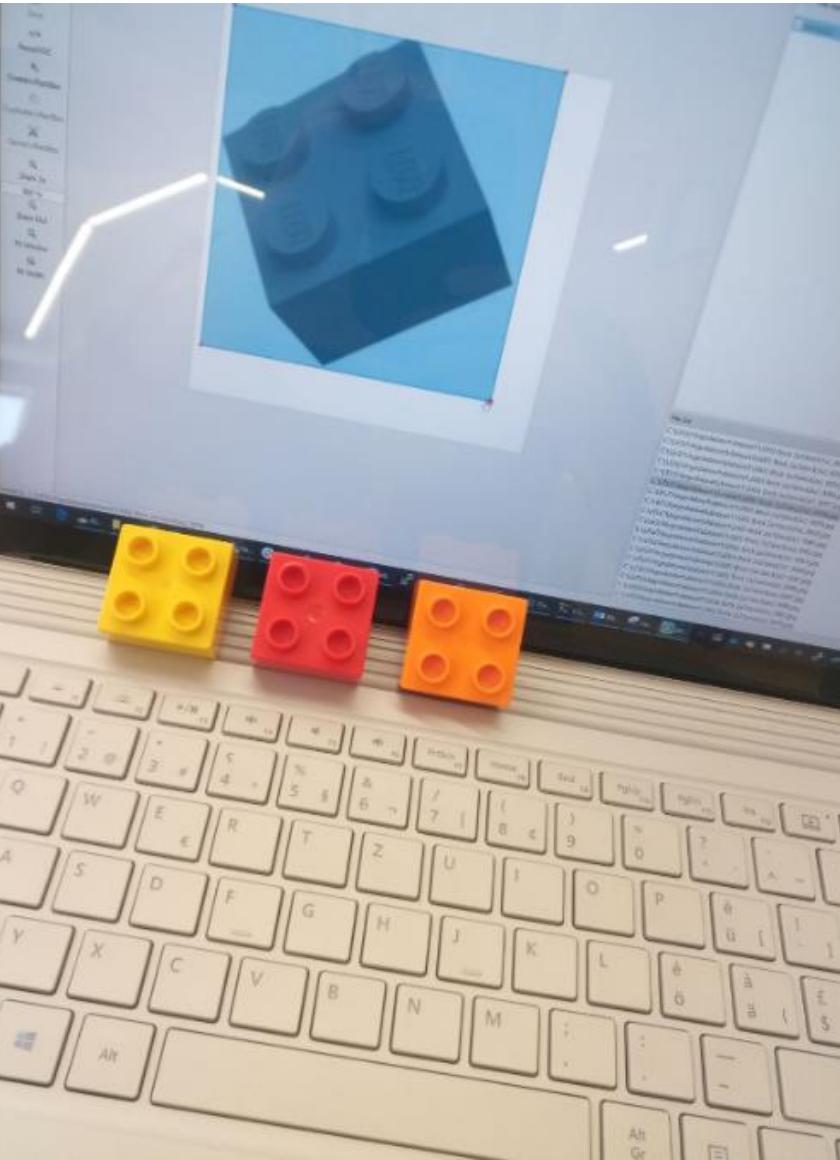
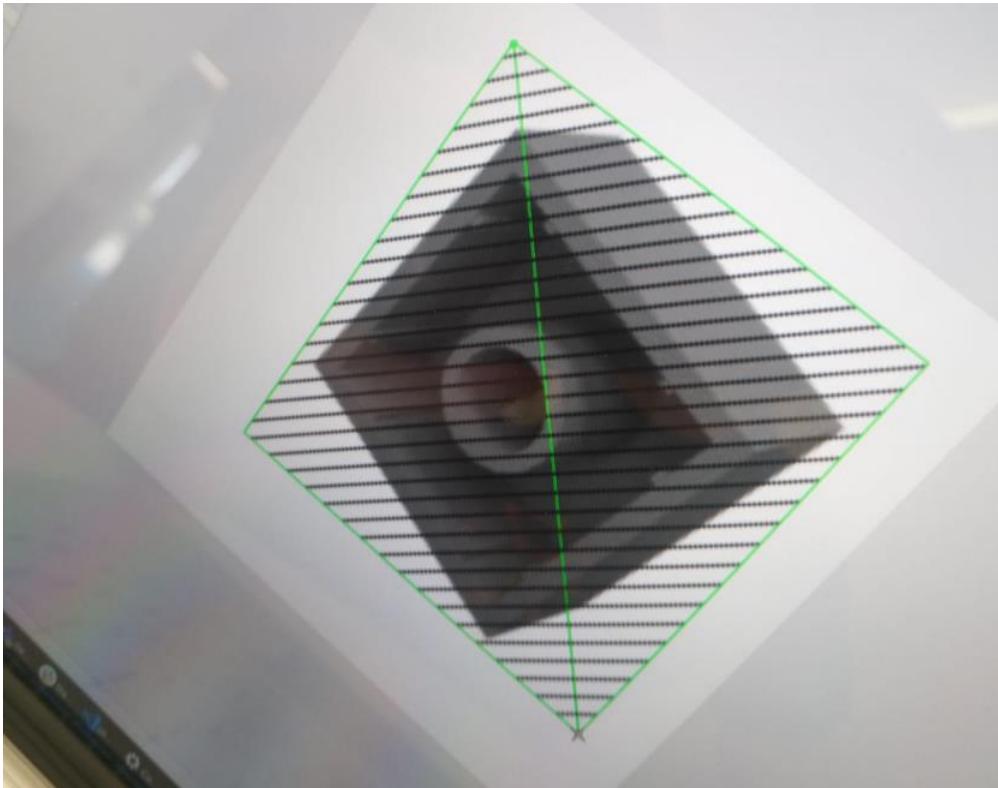
- Generally R-FCN and SSD models are faster on average while Faster R-CNN models are **more accurate**
- Faster R-CNN models can be faster if we limit the number of regions proposed

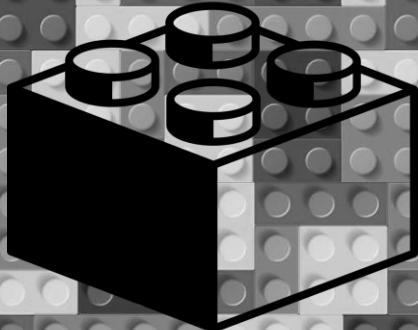


# etiquetado



# segmentación

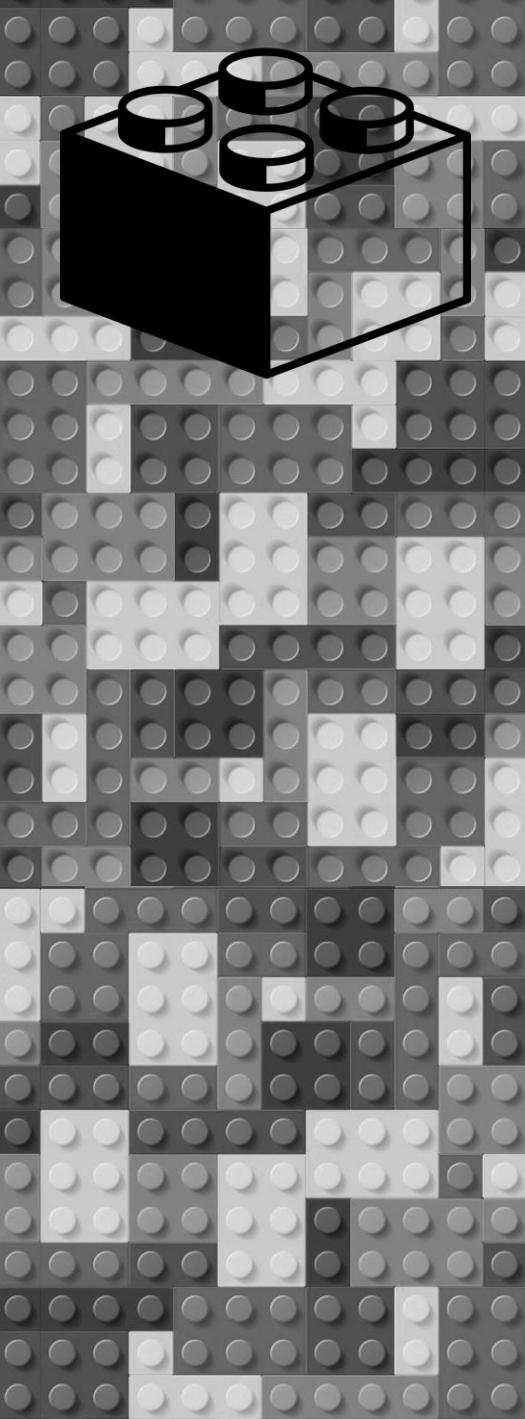
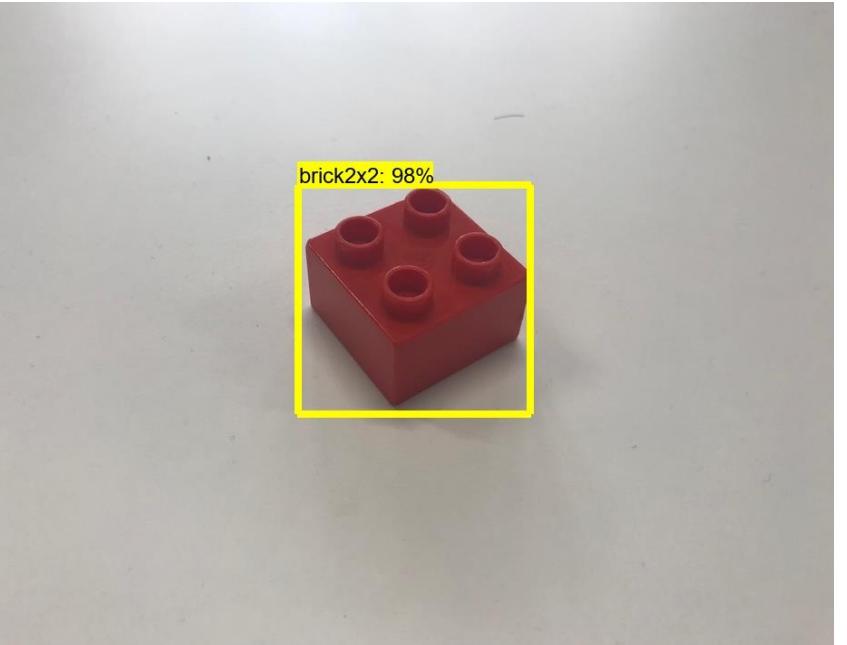
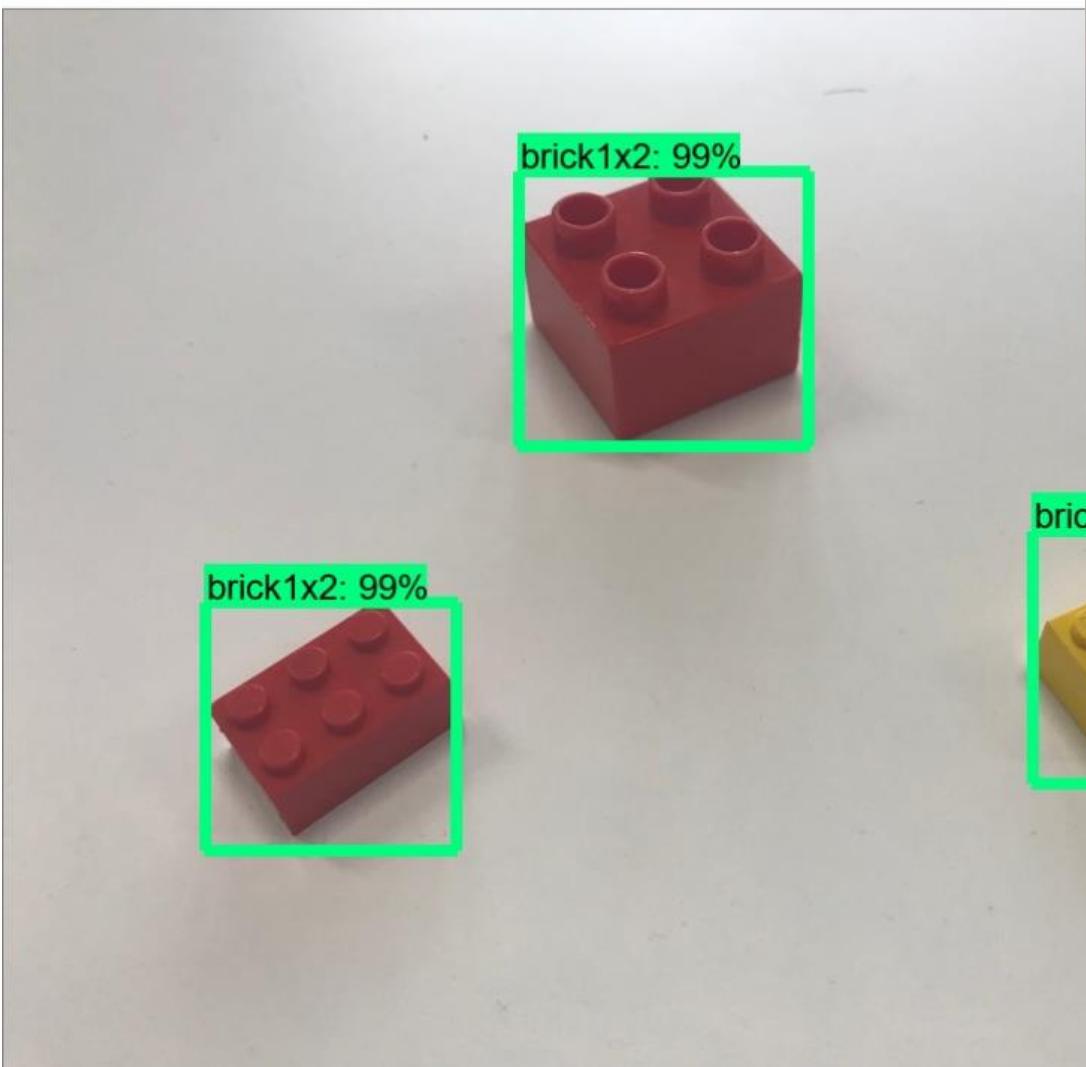




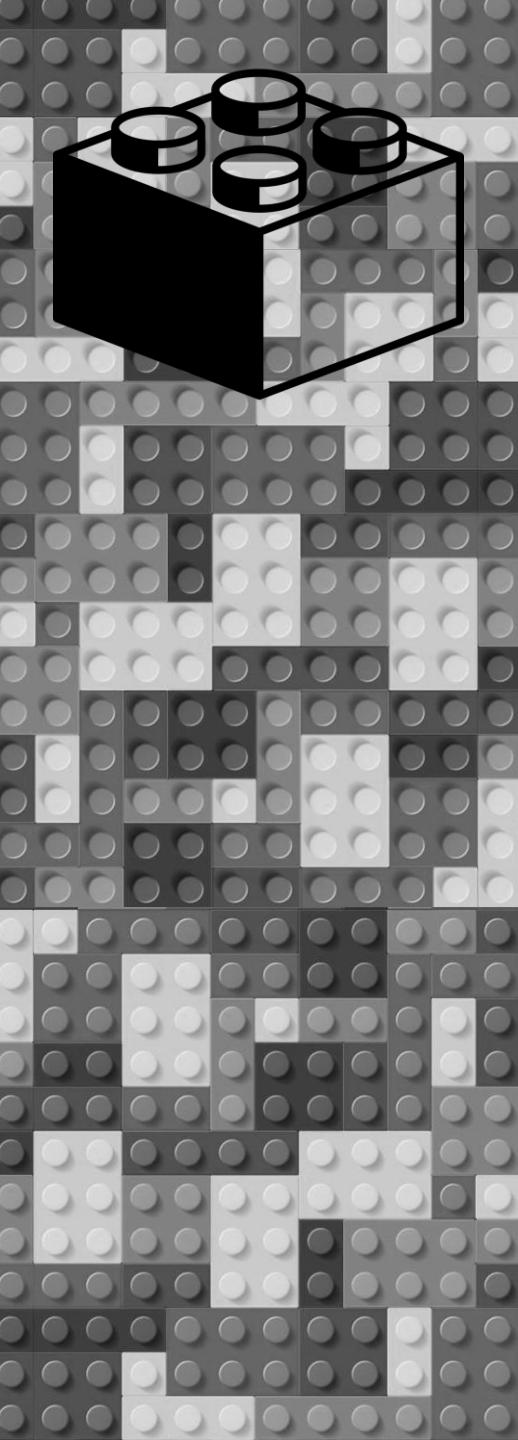
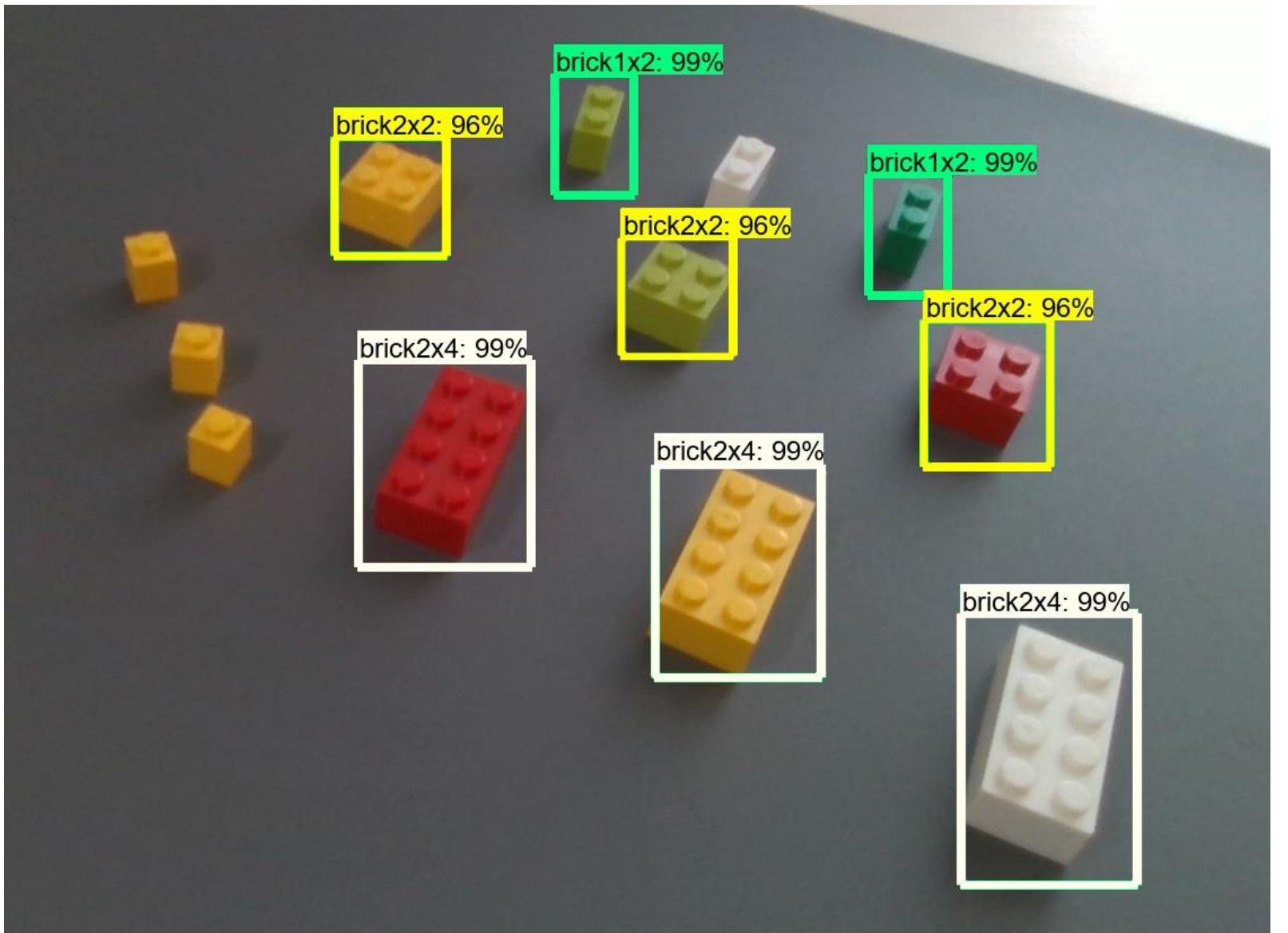
# no vamos bien

# mejorando

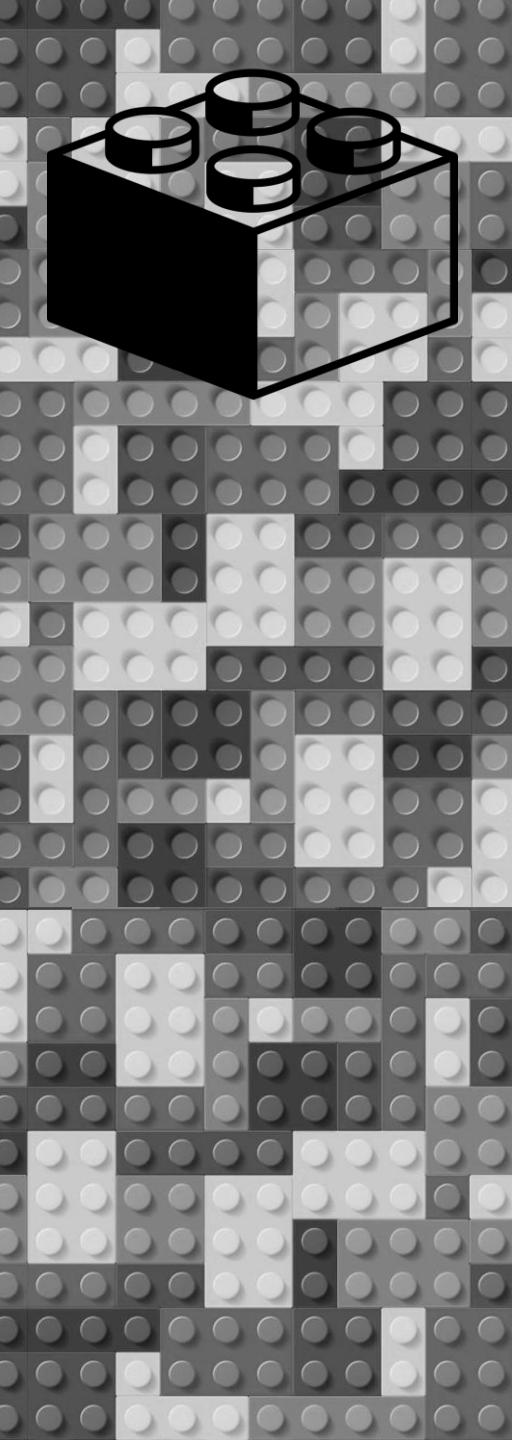
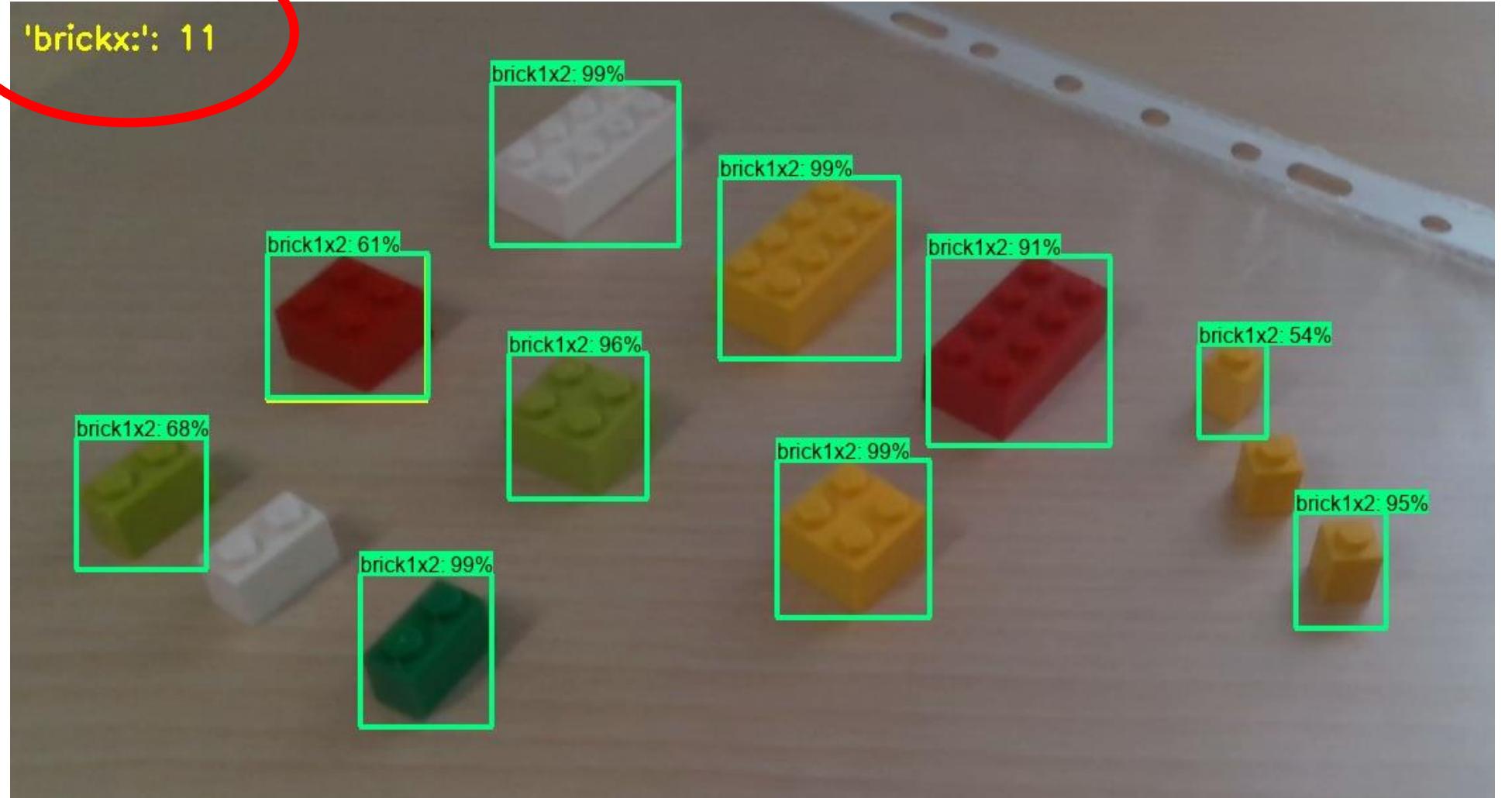
Object detector



# Mejorando algo más



# ..y empezando a contar



# más pasos

aumentar dataset

Input Image

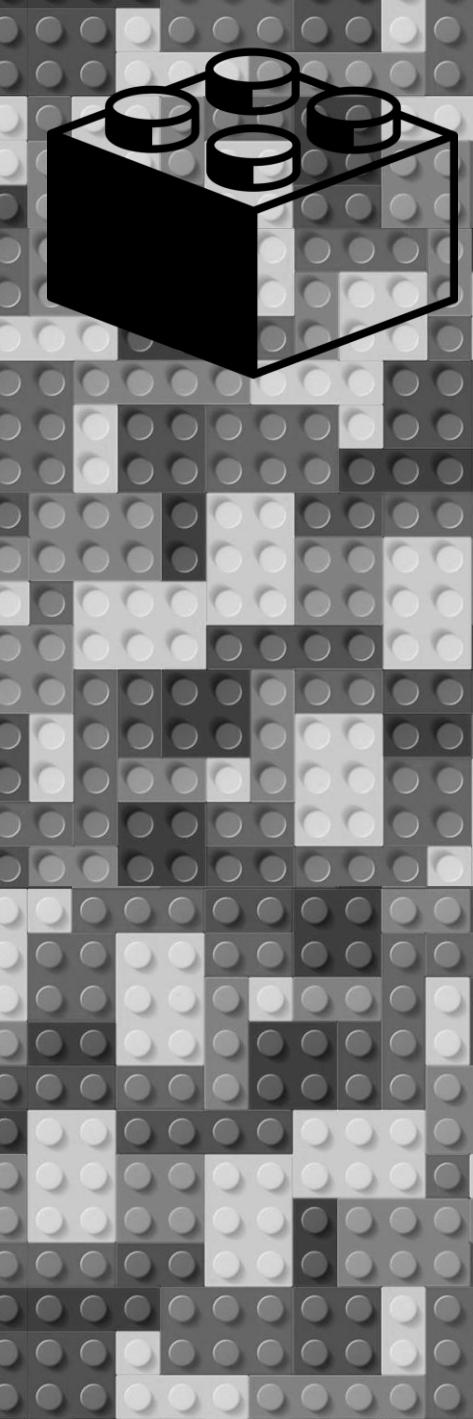


Augmented Images



matriz de confusión

aprendizaje dirigido

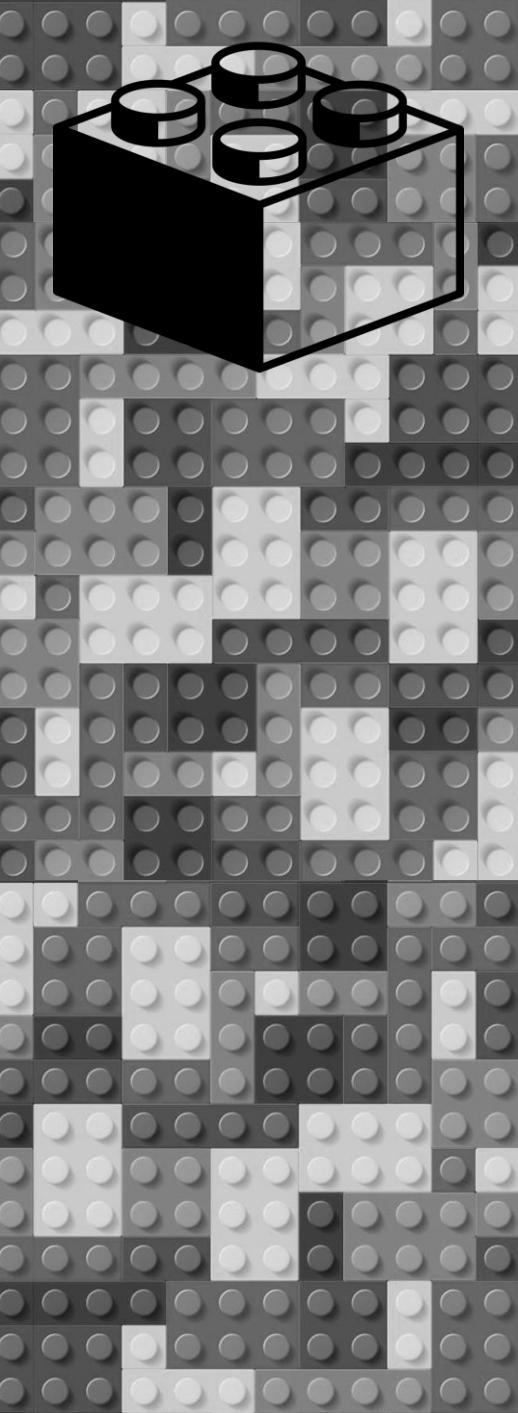
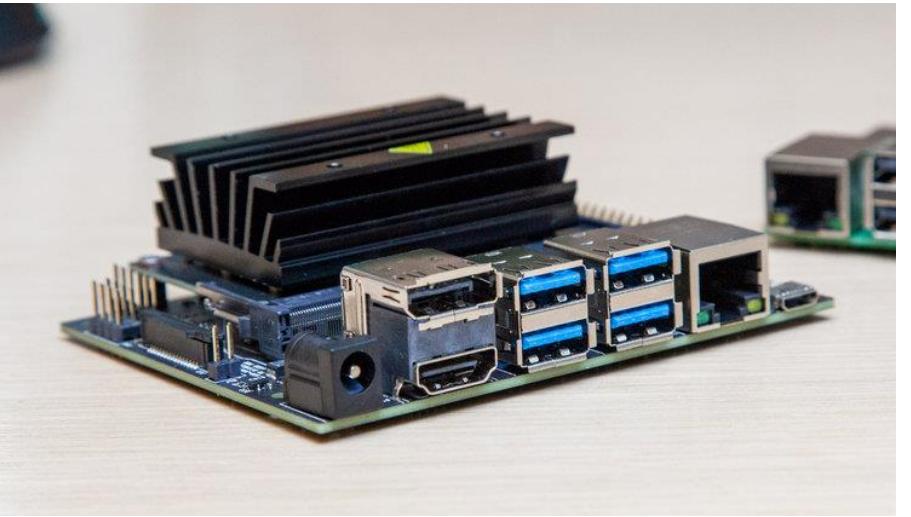
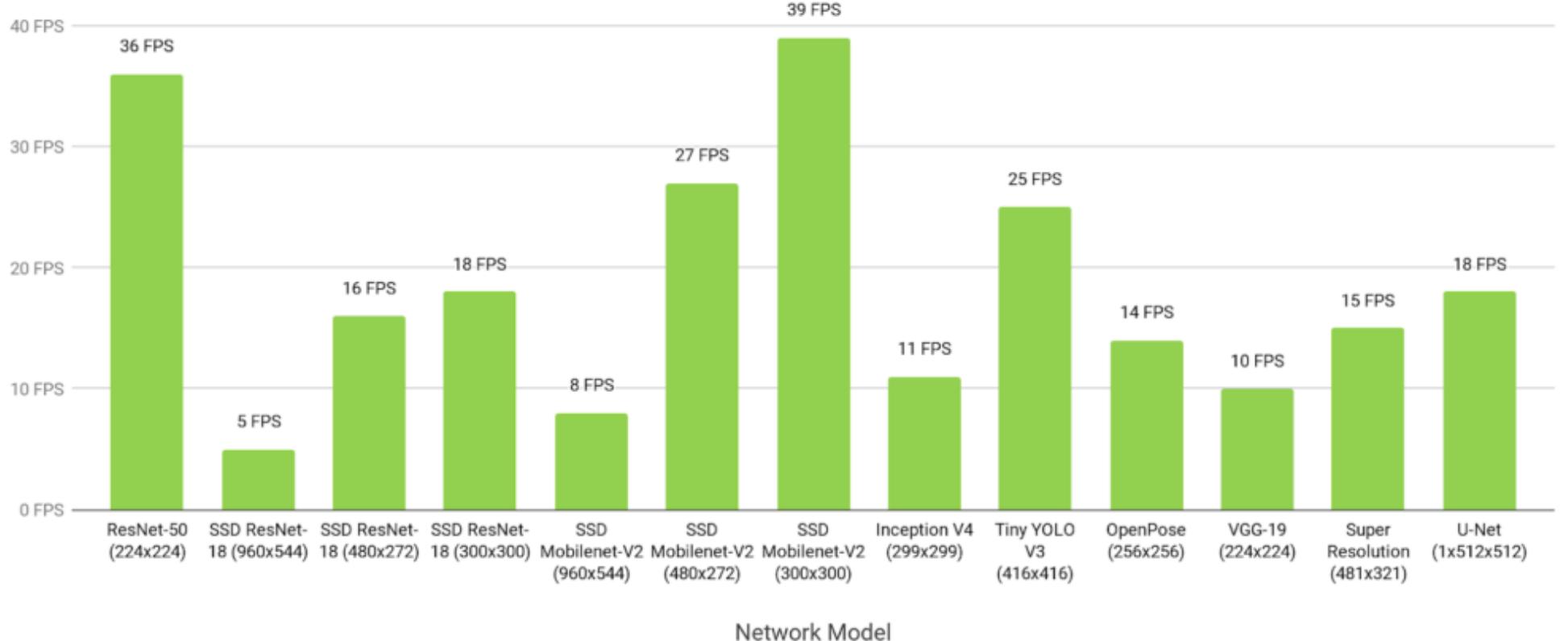


# La máquina

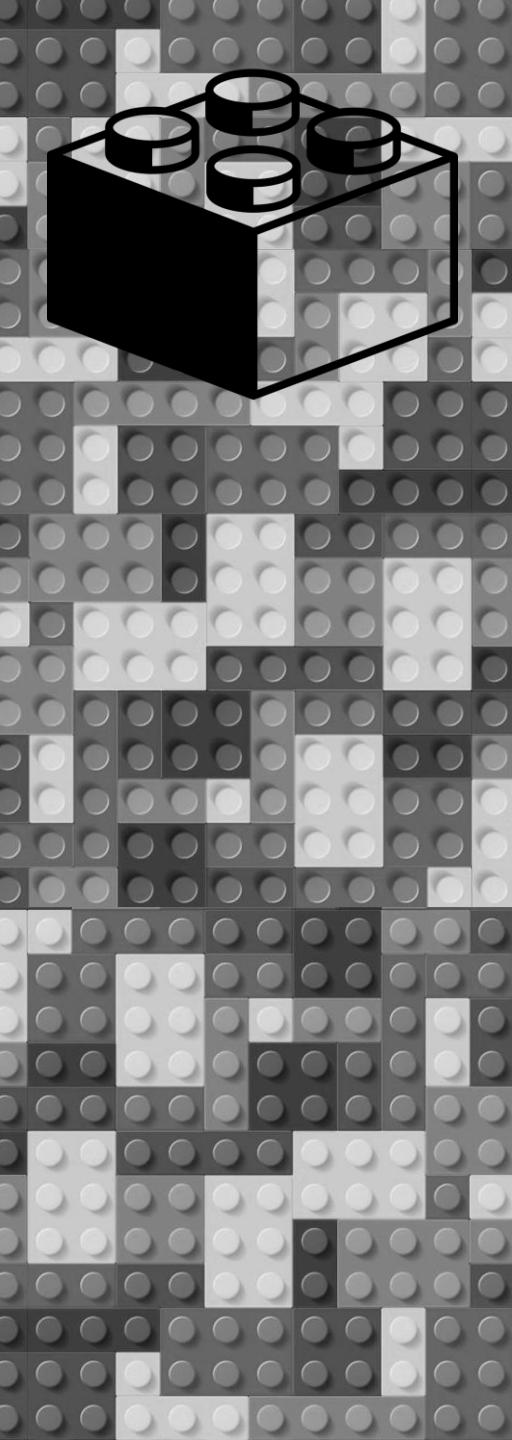
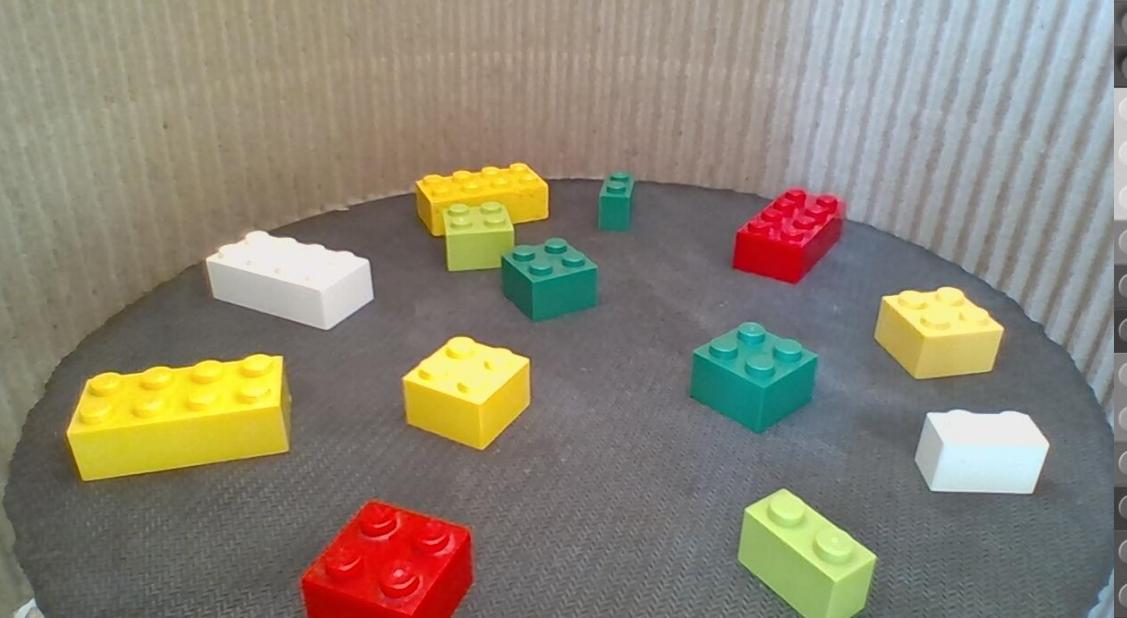
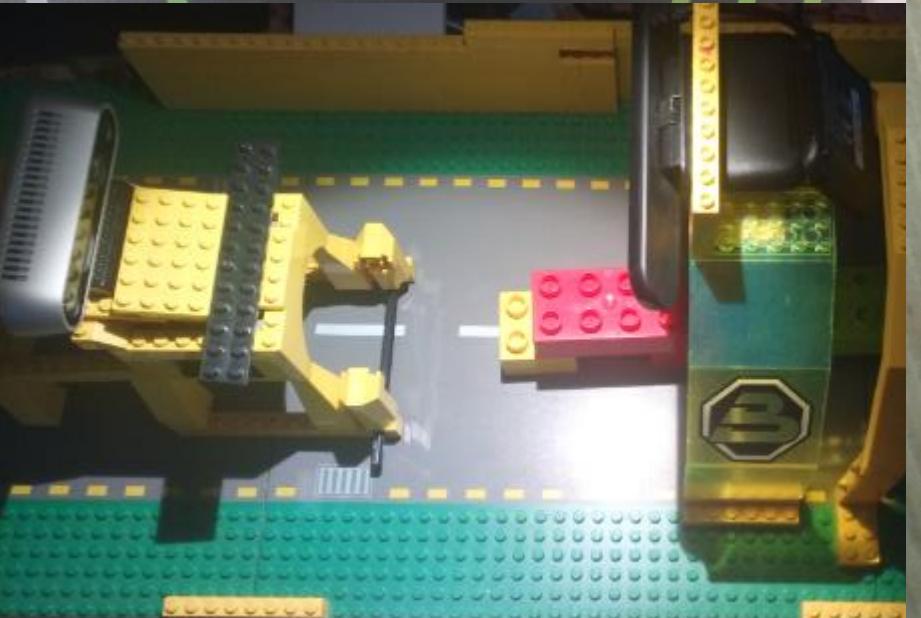
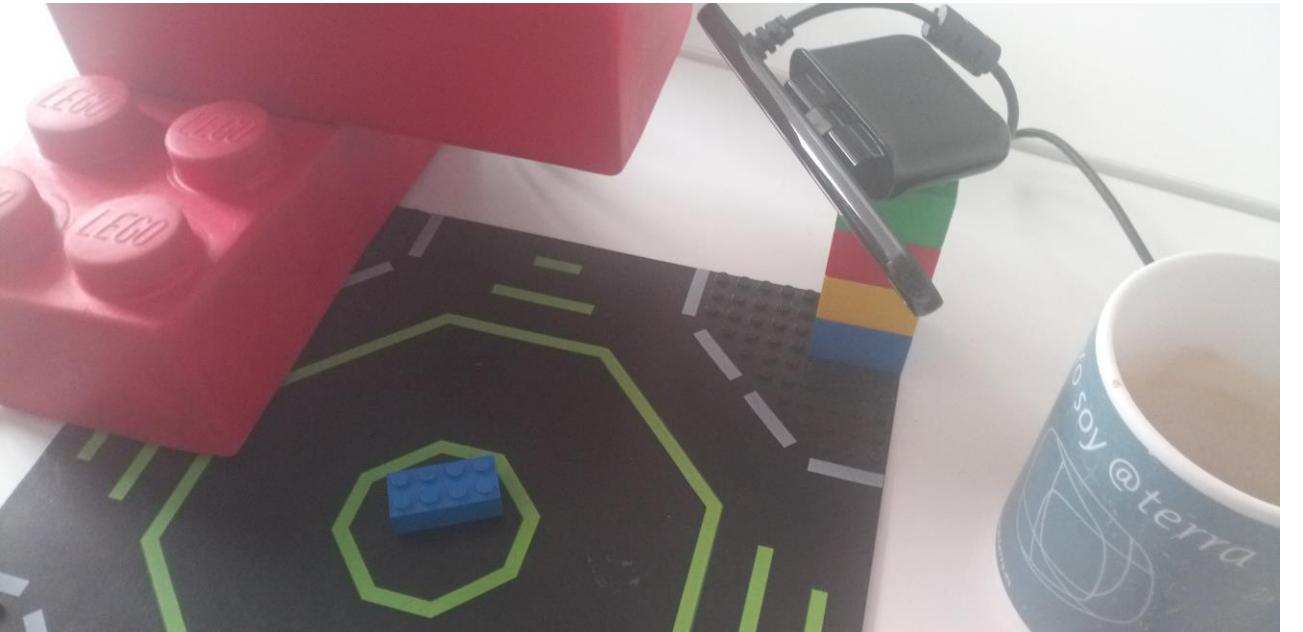


Deep Learning Inference Performance

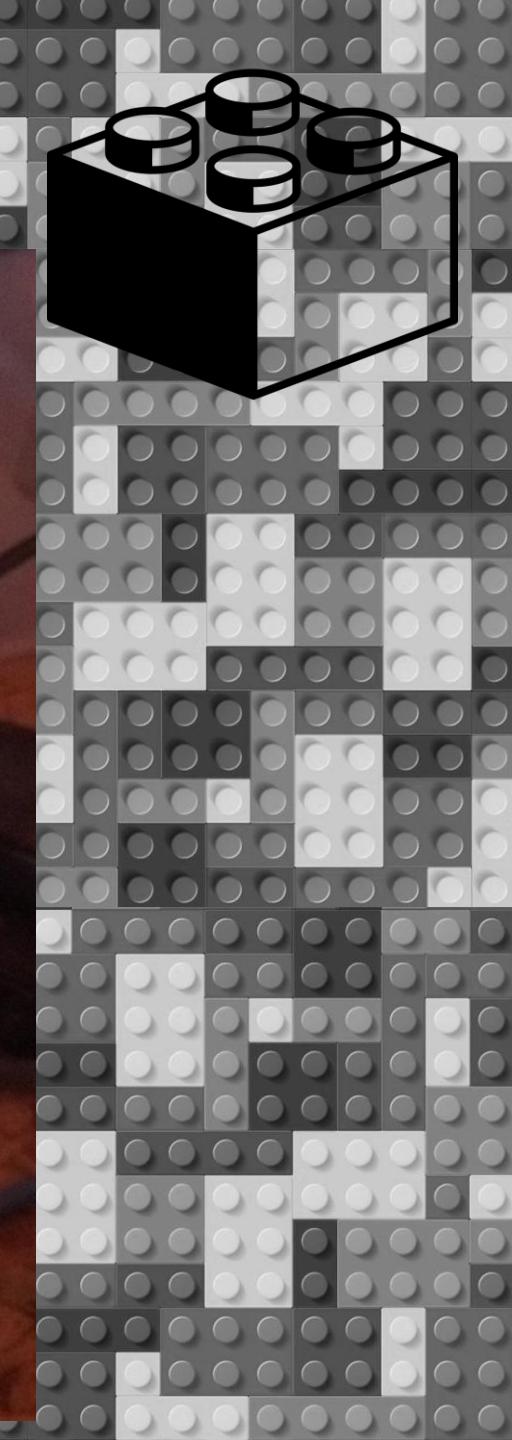
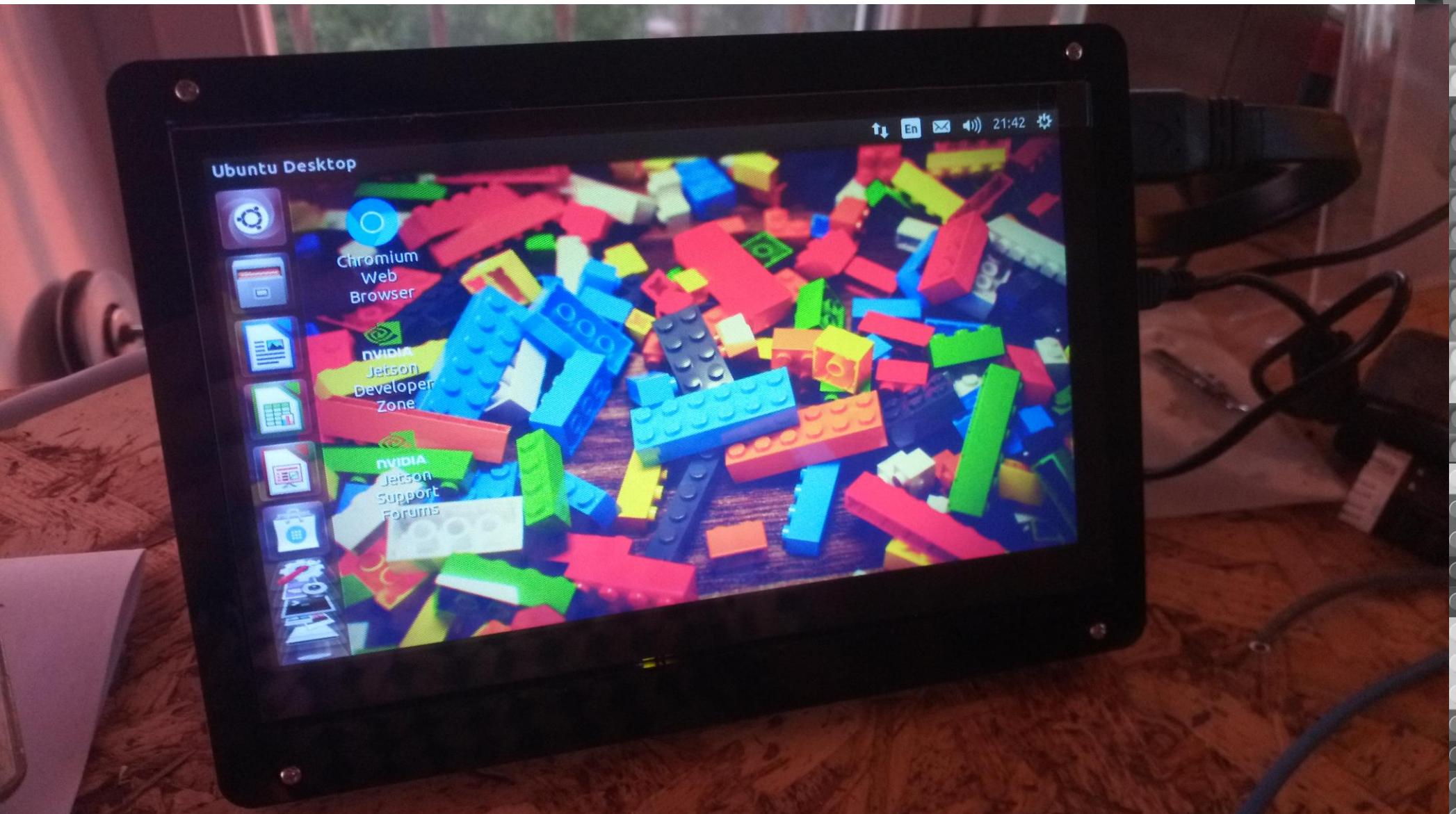
Jetson Nano (FP16, batch size 1)



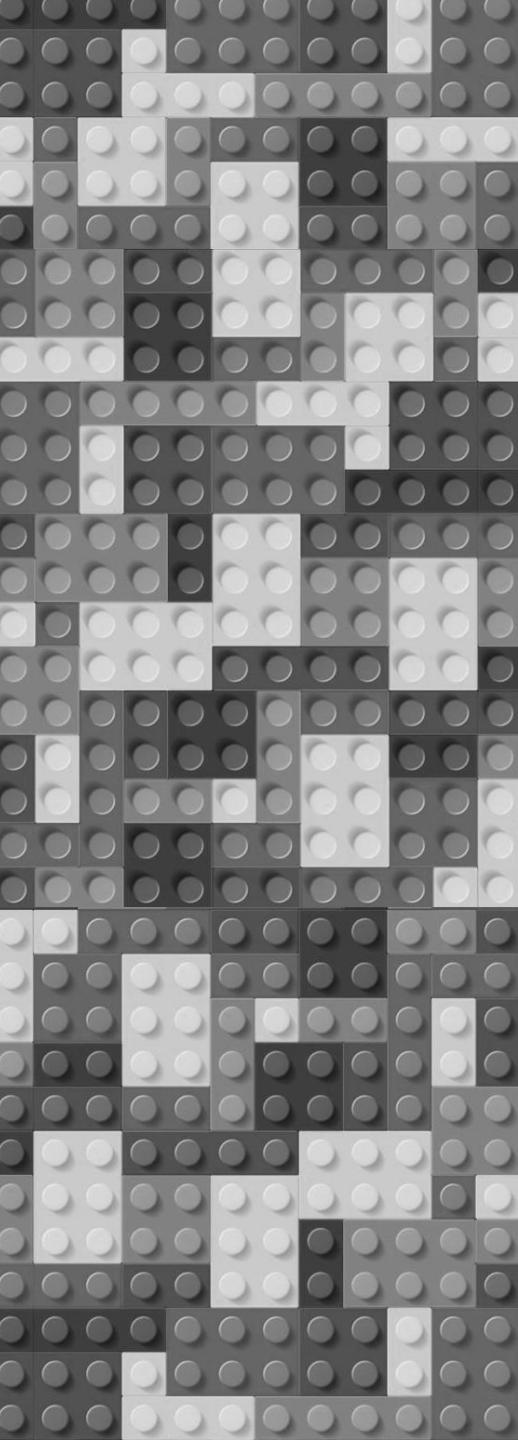
# La máquina



# La máquina



# La máquina





# VacuSort

REVOLUTIONARY BRICK SORTING VACUUM

## FEATURES

- Sort by color
- Sort by brick
- Separates dust
- Easy empty
- 5 speeds





COMPARTIR  
CONSTRUIR



Carlos Mozo  
Juan Carlos Peláez  
David Zamora  
Jorge Mozo

AI Saturdays  
Sevilla