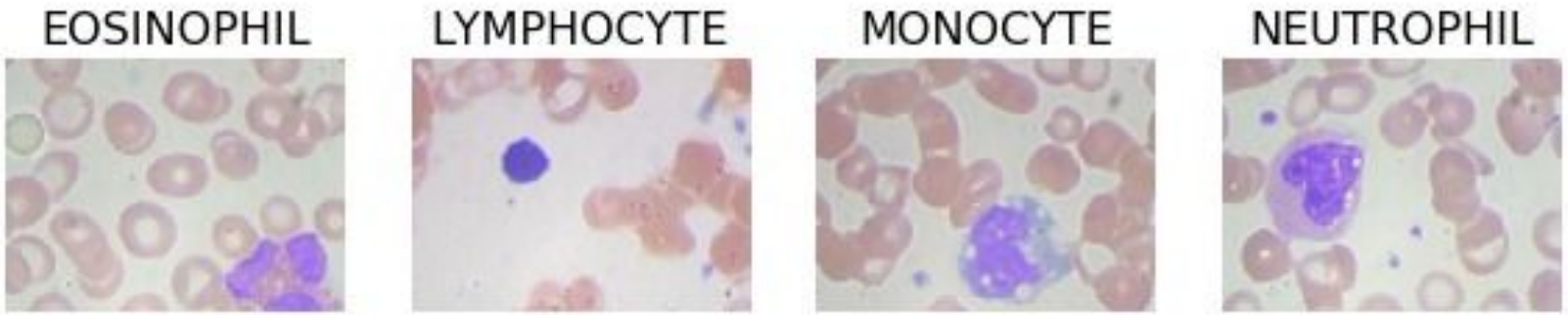
Clasificador de Células Blancas mediante Deep Learning

AI Summer TGN Demo Day

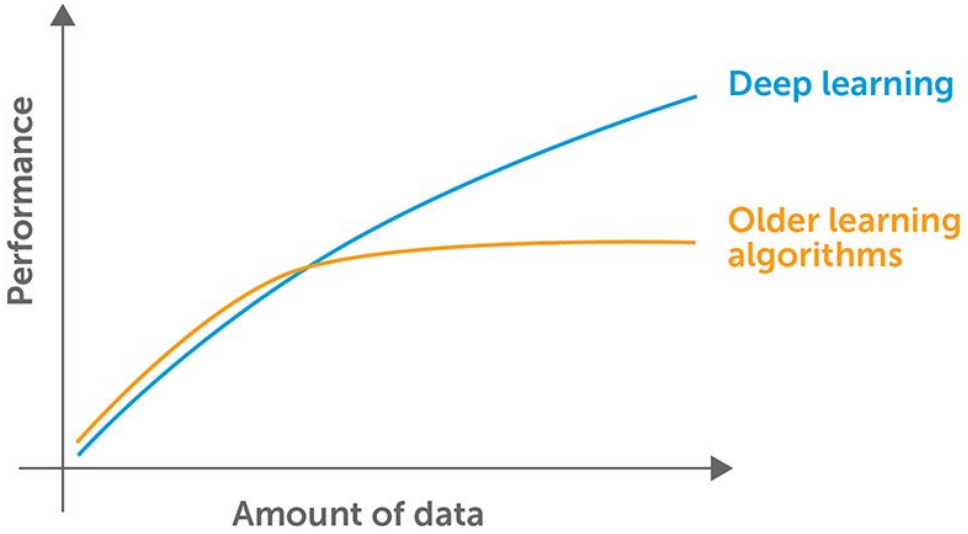
Gerard Porto - Juan Ramon Espuny

Clasificador de White Blood Cells



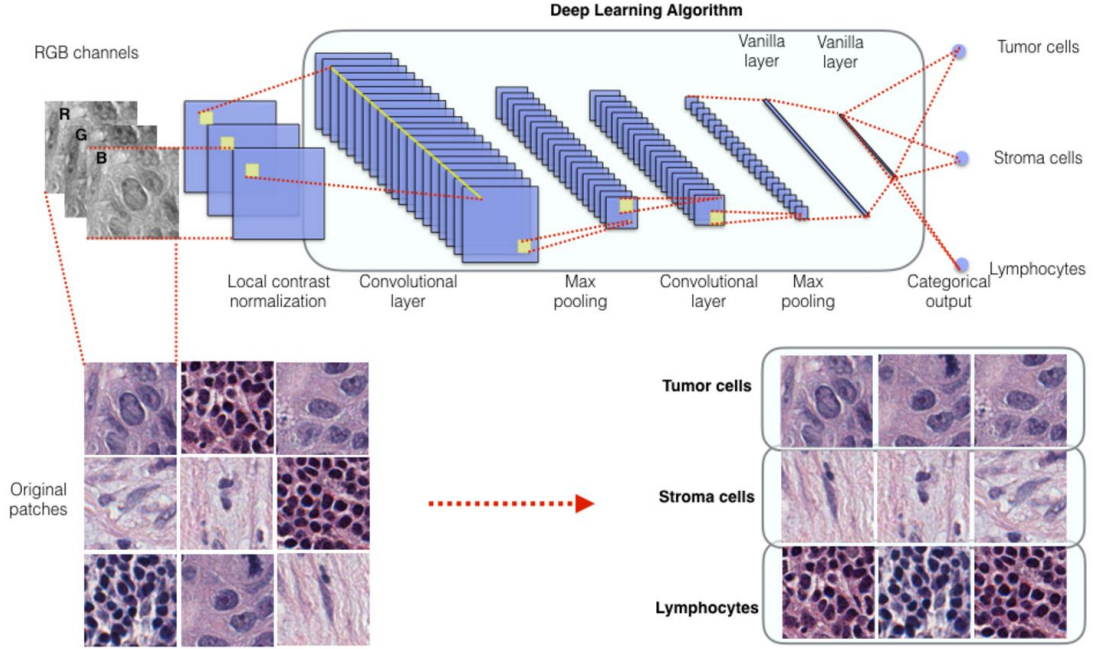
Enfoque AI

Deep Learning



How do data science techniques scale with amount of data?

CNN (Red Neural Convolucional)



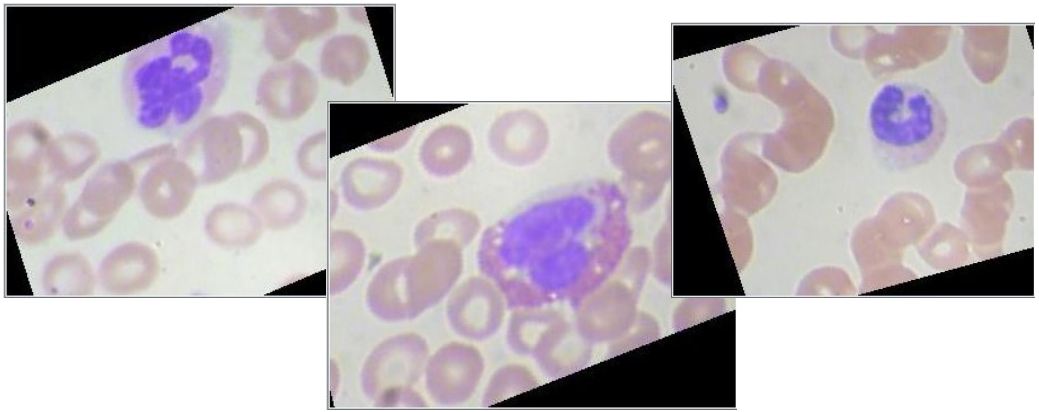
CNN

La obtención, limpieza , anotación y evaluación de los datos en su conjunto suponen una de las partes más costosas del proyecto, al menos el 60% del total.

Dataset

Dataset

- 400 imágenes
- Con Data augmentation producimos hasta 12.000



Creación del Modelo

Modelo

Resnet34, Size = 500, Batch Size= 50, LR = 0.01, Epoch = 3

In [12]:
```
arch=resnet34
data = ImageClassifierData.from_paths(PATH, tfms=tfms_from_model(arch, sz), bs=50)
learn = ConvLearner.pretrained(arch, data, precompute=True)
learn.fit(0.01, 3)
```

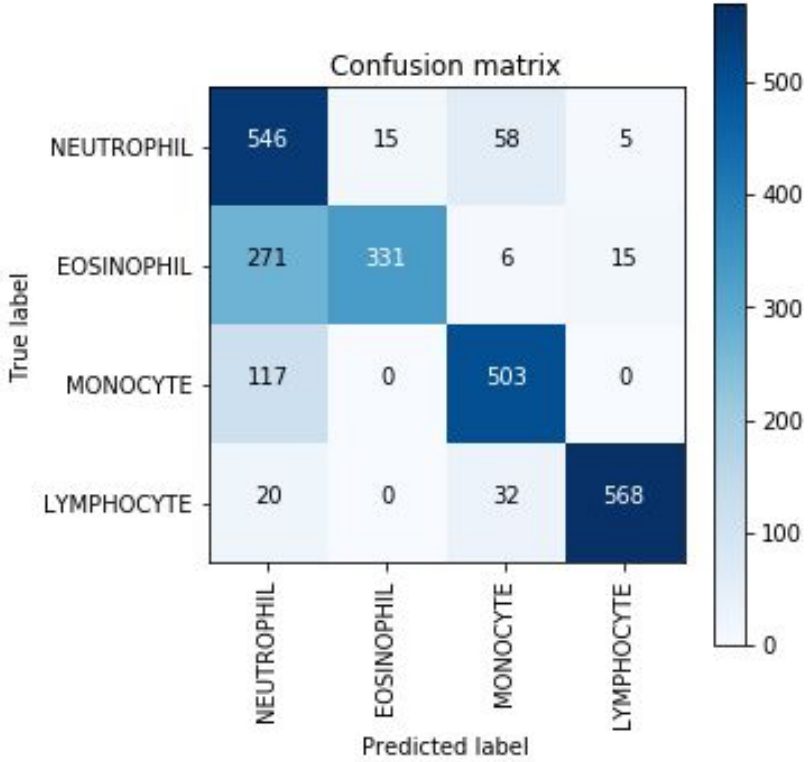
```
100%|██████████| 200/200 [06:47<00:00,  2.04s/it]
100%|██████████| 2/2 [00:03<00:00,  1.57s/it]
```

A Jupyter widget could not be displayed because the widget state could not be found. This could happen if the kernel storing the widget is no longer available, or if the widget state was not saved in the notebook. You may be able to create the widget by running the appropriate cells.

epoch	trn_loss	val_loss	accuracy
0	0.859597	0.763409	0.746479
1	0.700097	0.793292	0.788732
2	0.585287	0.869527	0.704225

Out[12]:
```
[array([0.86953]), 0.7042253697422188]
```

Modelo


Confusion matrix
NEUTROPHIL
EOSINOPHIL
MONOCYTE
LYMPHOCYTE
True label
546
15
58
5
271
331
6
15
117
0
503
0
20
0
32
568
NEUTROPHIL
EOSINOPHIL
MONOCYTE
LYMPHOCYTE
Predicted label
500
400
300
200
100
0

Lecciones Aprendidas

Lecciones aprendidas

- Escoger muy bien los datos y resaltar rasgos
- Ajustar el Training Loss / Validation Loss y Overfitting
- Es importante tener suficiente potencia de cálculo
- El camino es largo, continuar aprendiendo ...

Q&A

TheAcademy.AI

Gracias