

The background is a dark teal color. It is decorated with stylized leaf patterns in a lighter teal and gold color. The leaves are arranged in clusters around the central text, with some larger, more detailed leaves in the corners and smaller, simpler ones interspersed. The overall aesthetic is botanical and elegant.

Identifying Plants using Deep Learning

A presentation by Alik Ziker

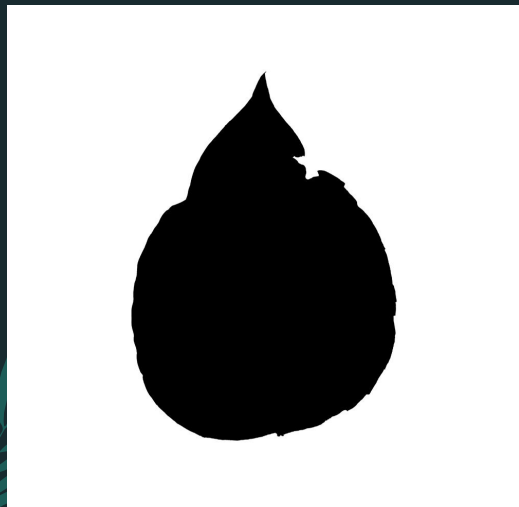
Inspiration



- More people (including myself) are purchasing and taking care of houseplants.
- Different plants need different amounts of care



Data



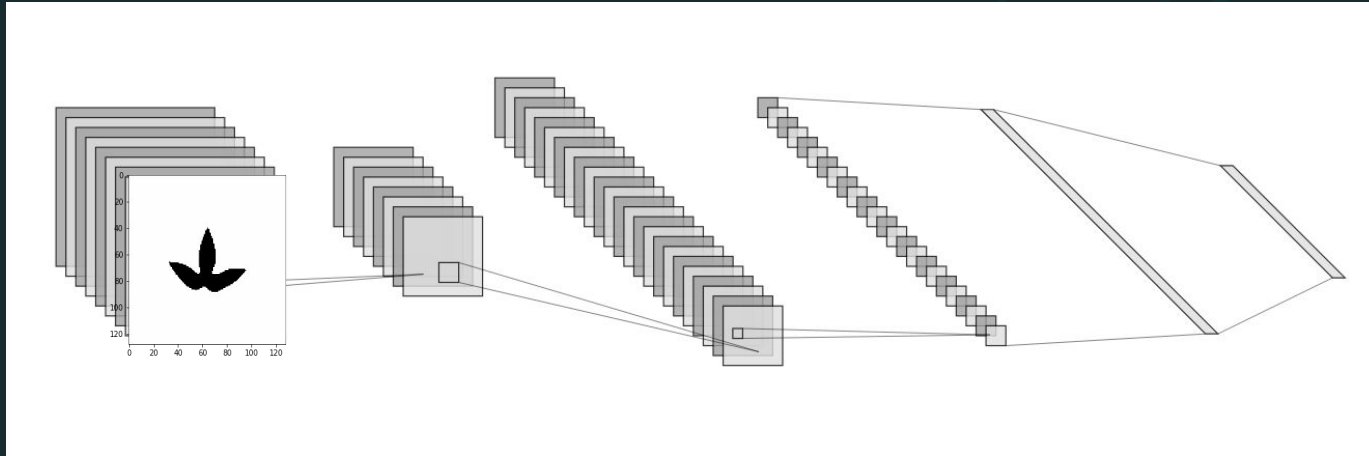
P. alata



P. amethystina

- 3300 images
- Passiflora species
- 40 unique genres
- 1000x1000 pixels

Model Selection



Convolution layers -> Flattening layer -> Dense Layer ->
Output!



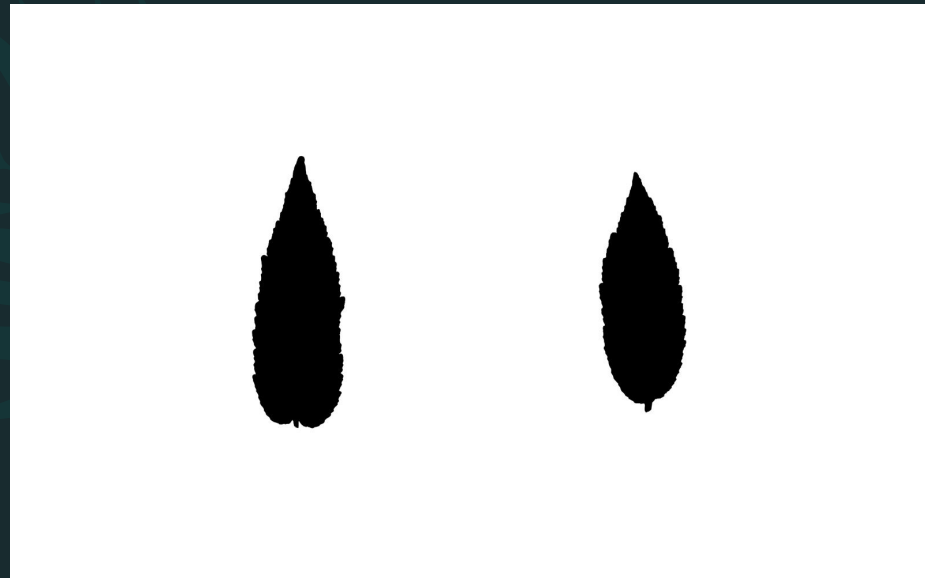
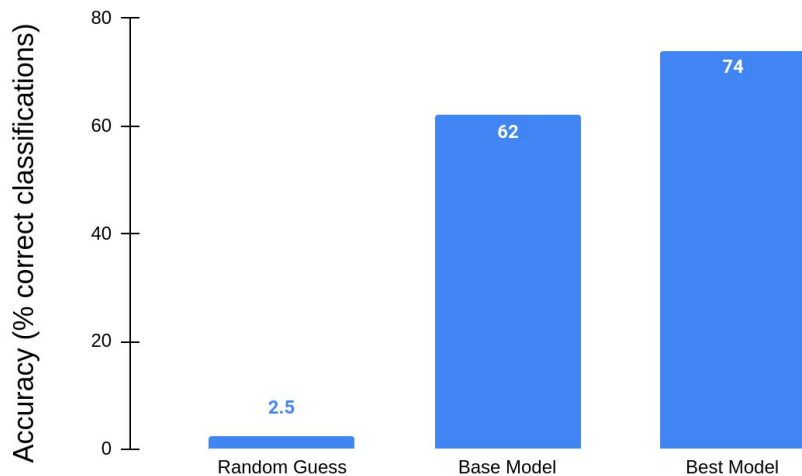
Key steps between models

- Regularization
- Dropout
- More pixels in images
- Transfer Learning



Results

Accuracy of Identifying Correct Plant Genus on Validation Data



Example of what the model is missing on:
P. coccinea and *P. miniata*

Conclusions

**Deep Learning
was appropriate
to solve problem**

Approached $\frac{3}{4}$ of
predictions being
correct



**Limited by
resources**

Both data and
computer
resources limited
model
performance



Future Work



More cloud
computing

01

02

03

Further investigation
of other transfer
learning architecture

More data (and
potentially colored
data)





Thank
You!

Thanks!

Do you have any questions?

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Appendix





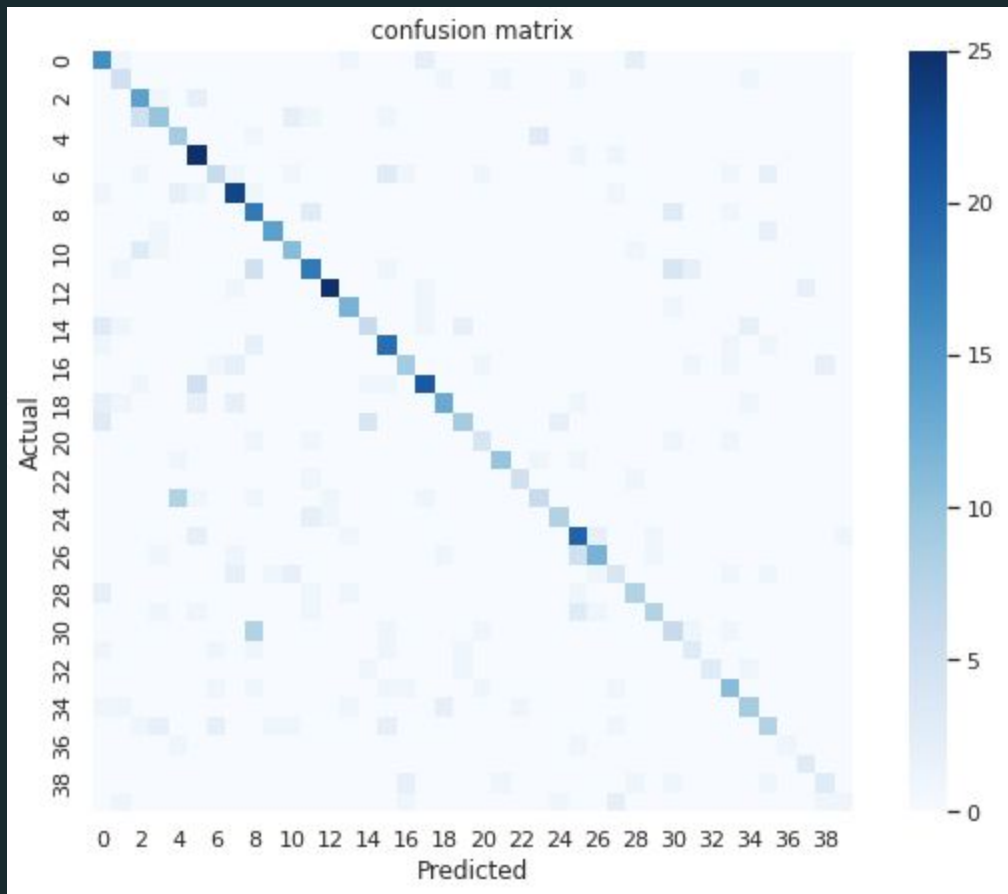
Pact = *P. actinia*
Pala = *P. alata*
Pame = *P. amethystina*
Pbif = *P. biflora*
Pcae = *P. caerulea*
Pcap = *P. capsularis*
Pcin = *P. cincinnata*
Pcoc = *P. coccinea*
Pcor = *P. coriacea*
Pcri = *P. cristalina*
Pedm = *P. edmundoi*
Pedu = *P. edulis*
Pfoe = *P. foetida* (*P. foetida* is represented by two abbreviations)
Pfii = *P. foetida* (*P. foetida* is represented by two abbreviations)
Pgal = *P. galbana*
Pgib = *P. gibertii*
Pgra = *P. gracilis*
Phat = *P. hatschbachii*
Pker = *P. kermesina*
Plig = *P. ligularis*
Pmaf = *P. maliformis*
Pmal = *P. malacophylla*
Pmic = *P. micropetala*
Pmie = *P. miersii*
Pmin = *P. miniata*
Pmis = *P. misera*
Pmol = *P. mollissima*
Pmor = *P. morifolia*
Pmuc = *P. mucronata*
Pnit = *P. nitida*
Porg = *P. organensis*
Ppoh = *P. pohlii*
Prac = *P. racemosa*
Prub = *P. rubra*
Pset = *P. setacea*
Psid = *P. sidifolia*
Psub = *P. suberosa*
Pten = *P. tenuifila*
Ptlo = *P. triloba*
Ptri = *P. tricuspis*
Pvil = *P. villosa*

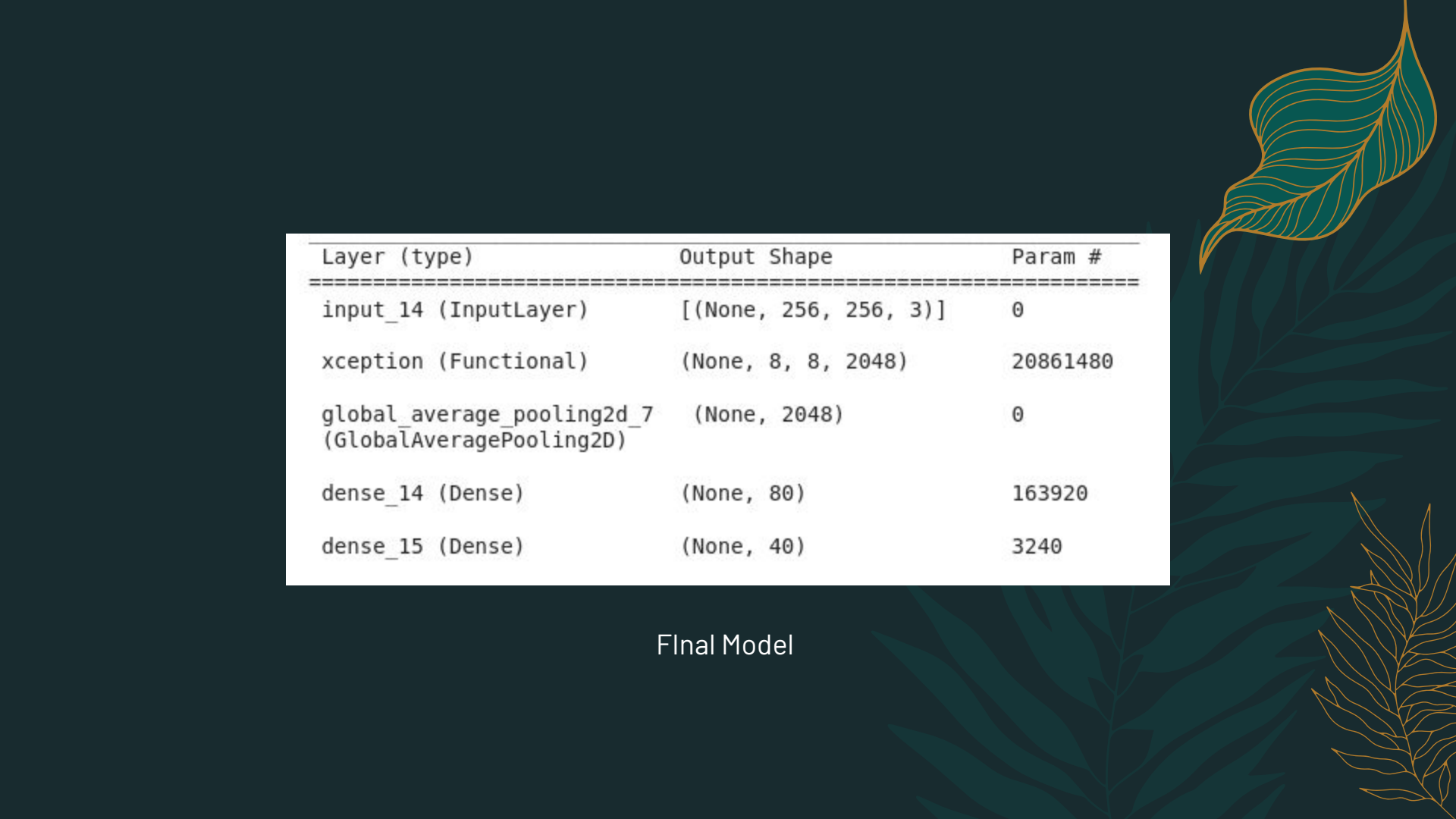


conv2d_9 (Conv2D)	(None, 80, 80, 30)	840
max_pooling2d_6 (MaxPooling2D)	(None, 40, 40, 30)	0
conv2d_10 (Conv2D)	(None, 40, 40, 60)	16260
max_pooling2d_7 (MaxPooling2D)	(None, 20, 20, 60)	0
conv2d_11 (Conv2D)	(None, 20, 20, 90)	48690
global_average_pooling2d_3 (GlobalAveragePooling2D)	(None, 90)	0
flatten_3 (Flatten)	(None, 90)	0
dense_6 (Dense)	(None, 80)	7280
dense_7 (Dense)	(None, 40)	3240

Base model







Layer (type)	Output Shape	Param #
input_14 (InputLayer)	[(None, 256, 256, 3)]	0
xception (Functional)	(None, 8, 8, 2048)	20861480
global_average_pooling2d_7 (GlobalAveragePooling2D)	(None, 2048)	0
dense_14 (Dense)	(None, 80)	163920
dense_15 (Dense)	(None, 40)	3240

Final Model