Plant disease recognition with CNN

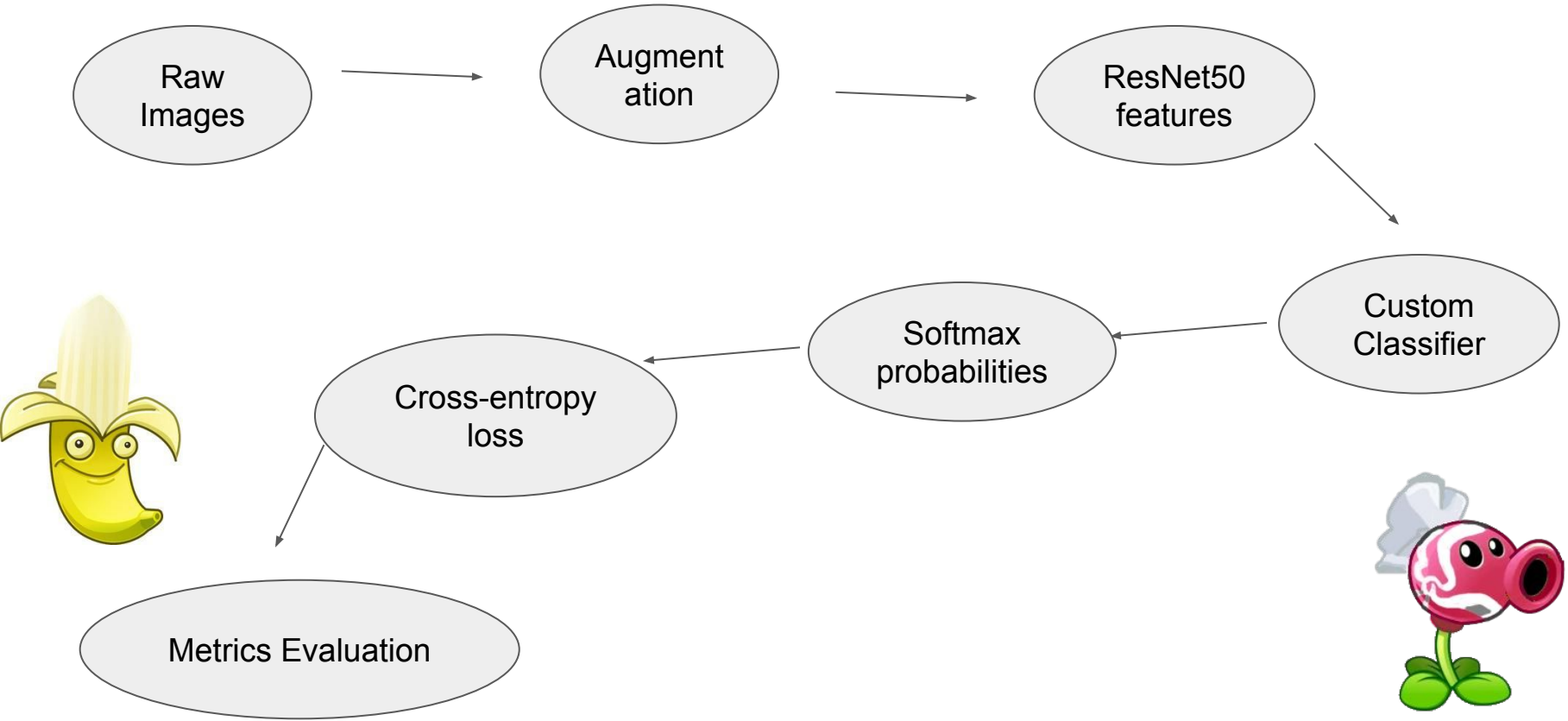
By Nathan Aguirre

Introduction (1-2 minutes)

Problem statement: Using a CNN can we use a image based classification system to spot plant diseases from photos?

Why This matters

Key Algorithms and methodologies (1.30 time)



Architecture overview (1.20)

Image (224×224×3)

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ResNet50 (frozen)

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Feature Vector (2048)

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FC Layer 1 (512) + Dropout

↓

FC Layer 2 (256) + Dropout

↓

Output Layer (38 classes)

↓

Softmax → Probabilities

Implementation highlights (1 minute)

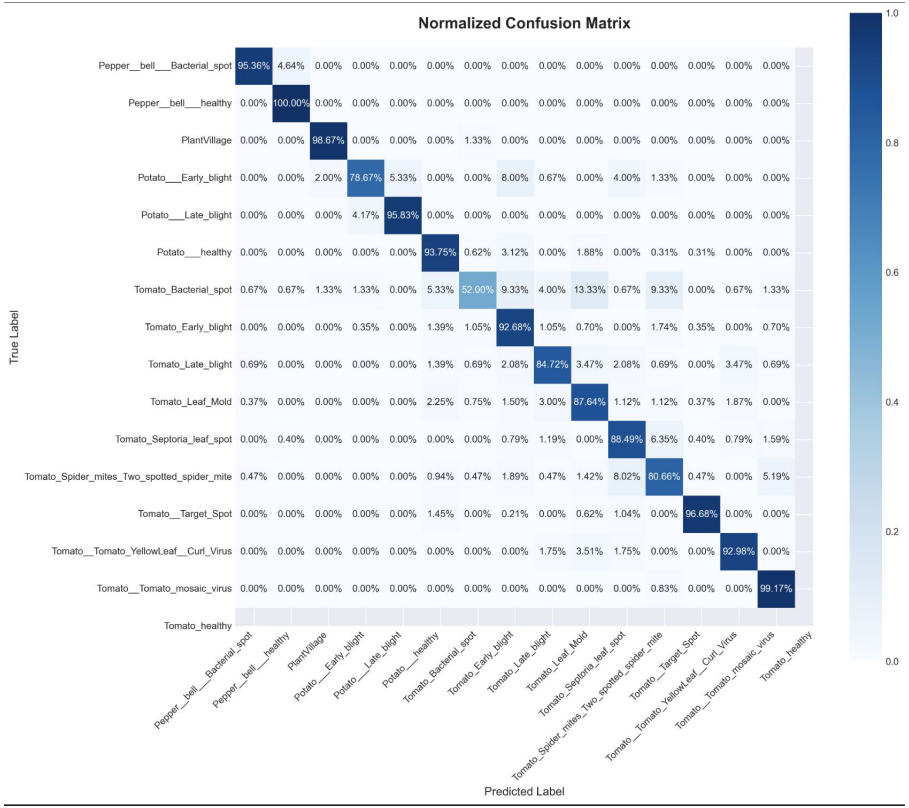
15-16 hours for full training WOW!!

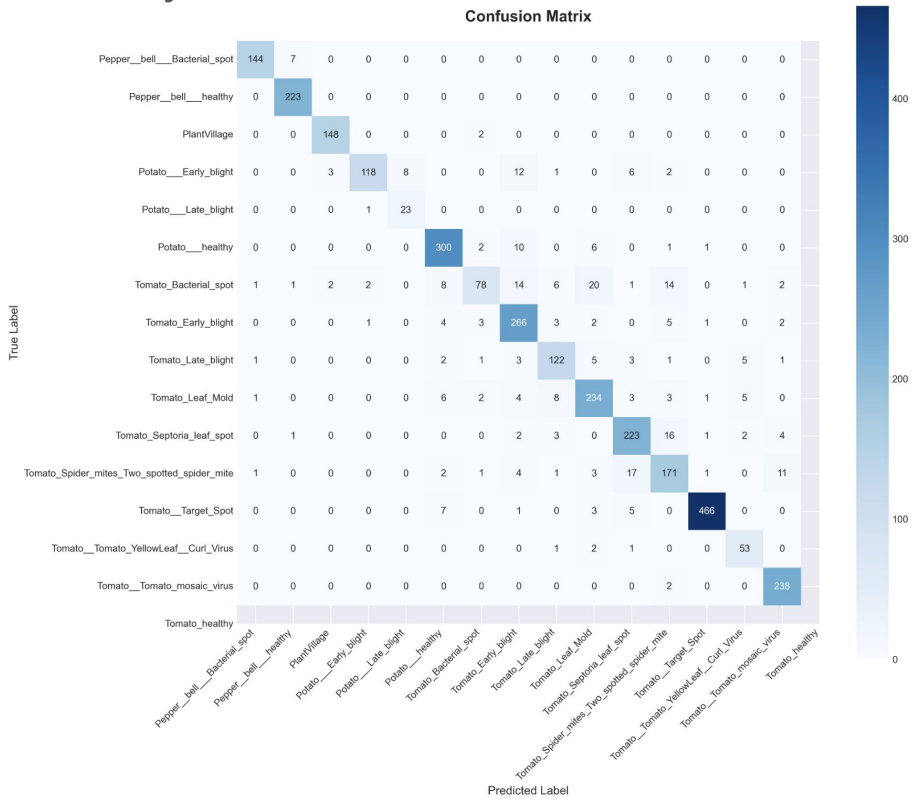
plantVillage hidden

Results & Analysis (3-4 minutes)

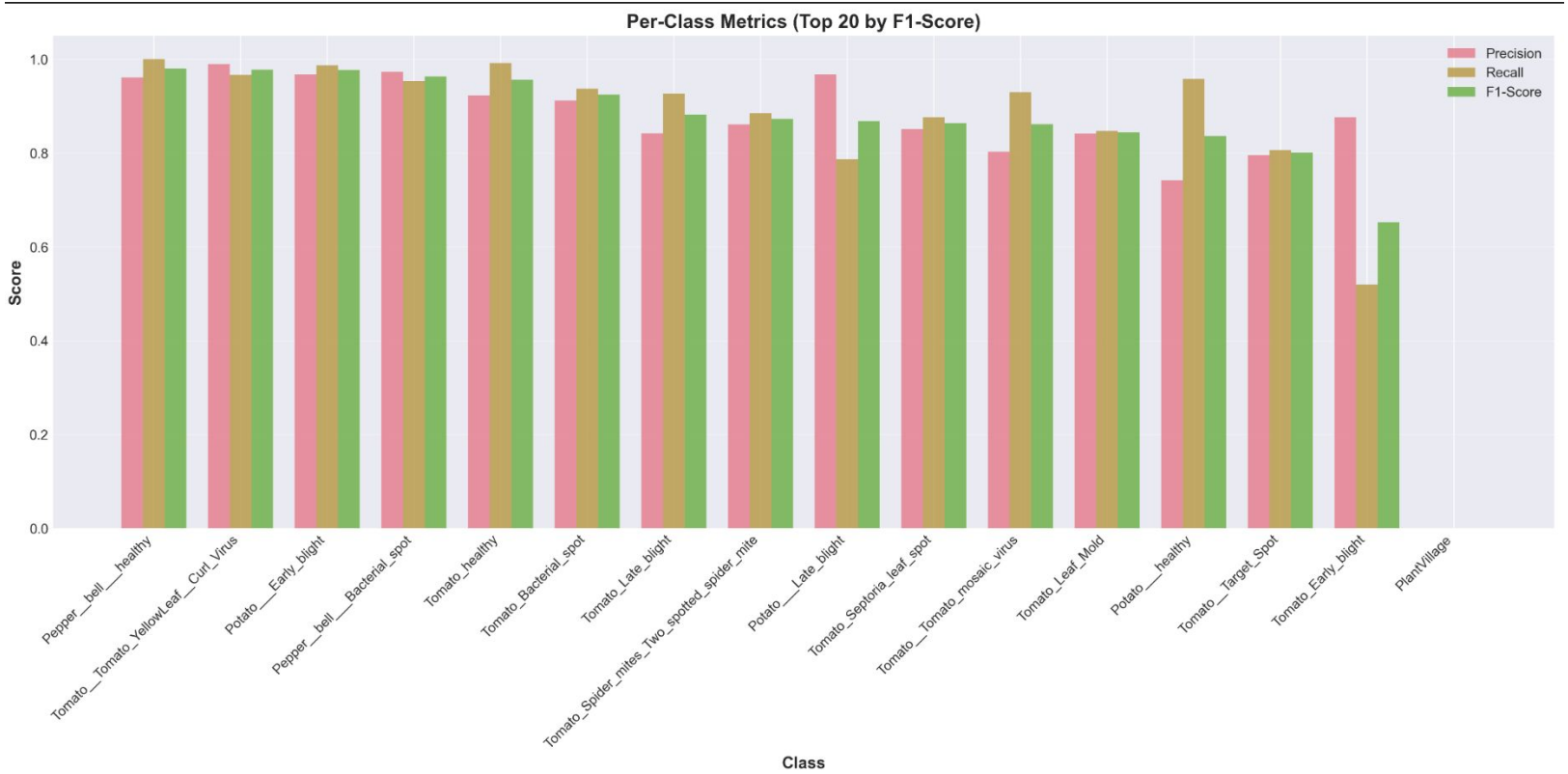
Accuracy 90.29%

Macro F1 0.8841,
Weighted F1 0.9005





Results continued



Comparison with baselines & key insights and findings

Random guess 2.6%

With Scratch training below 90% likely

Good F1 macro vs weighted

Error among more similar diseases

Conclusions (learnings and improvements) (1 minute)

Pytorch

ResNet

PlantVillage

https://www.kaggle.com/datasets/emmarex/plantdisease

Model

Cross validation (not any time soon)