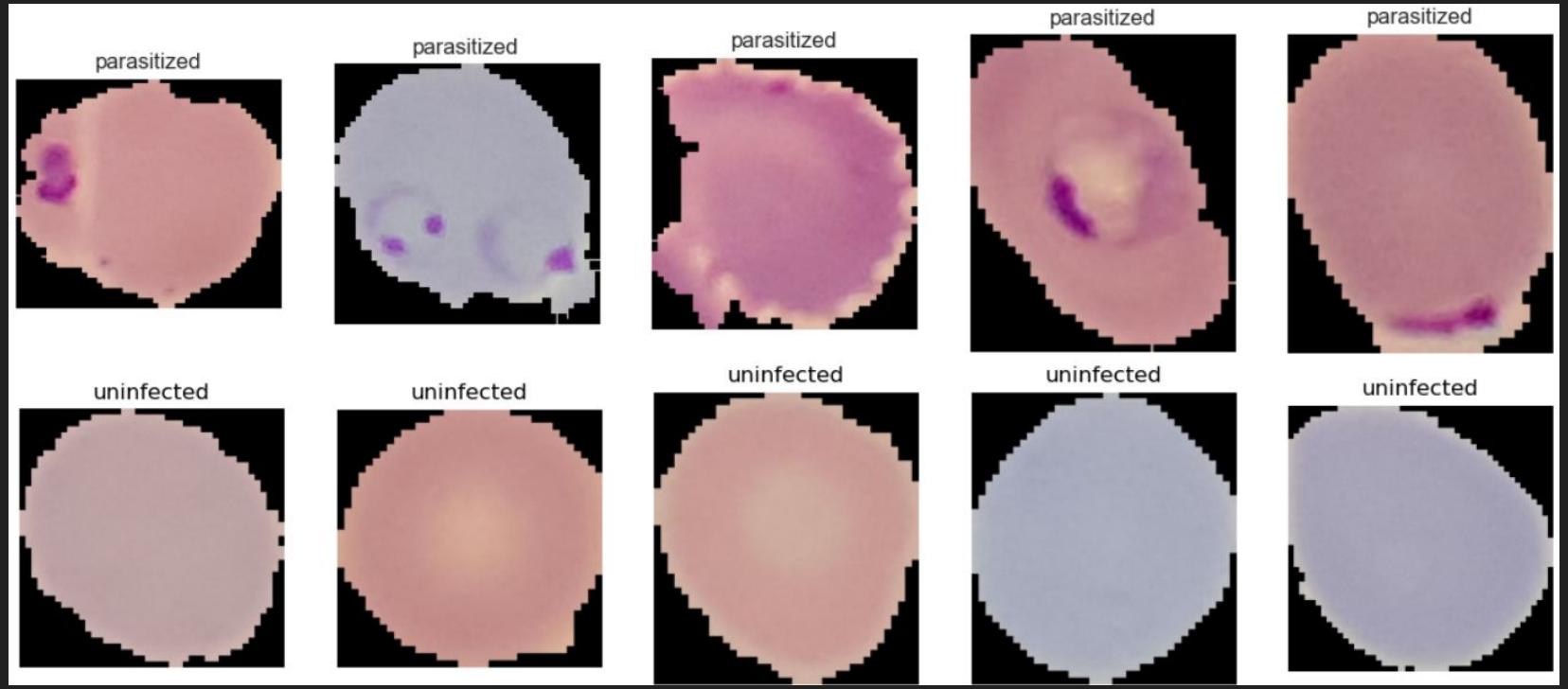
Deep Learning model for Malaria Detection

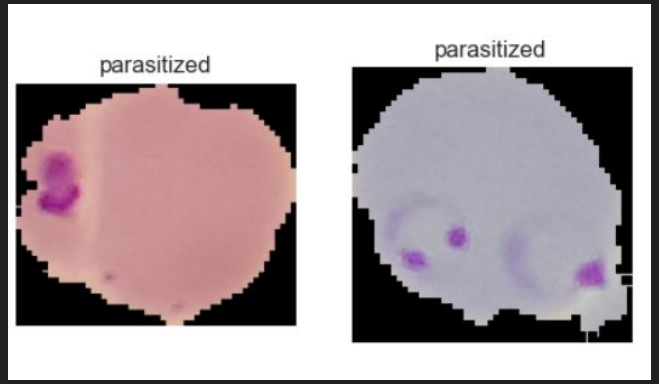


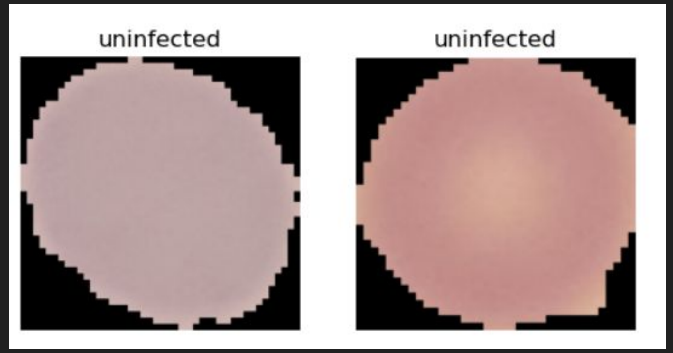
Problems with manual diagnosis:

- Time-consuming
- Inter-observer variability

Objective:

Creation of an **automated computer vision model** to identify parasitized cells





Data:

27,558 labelled images (parasitised/uninfected):

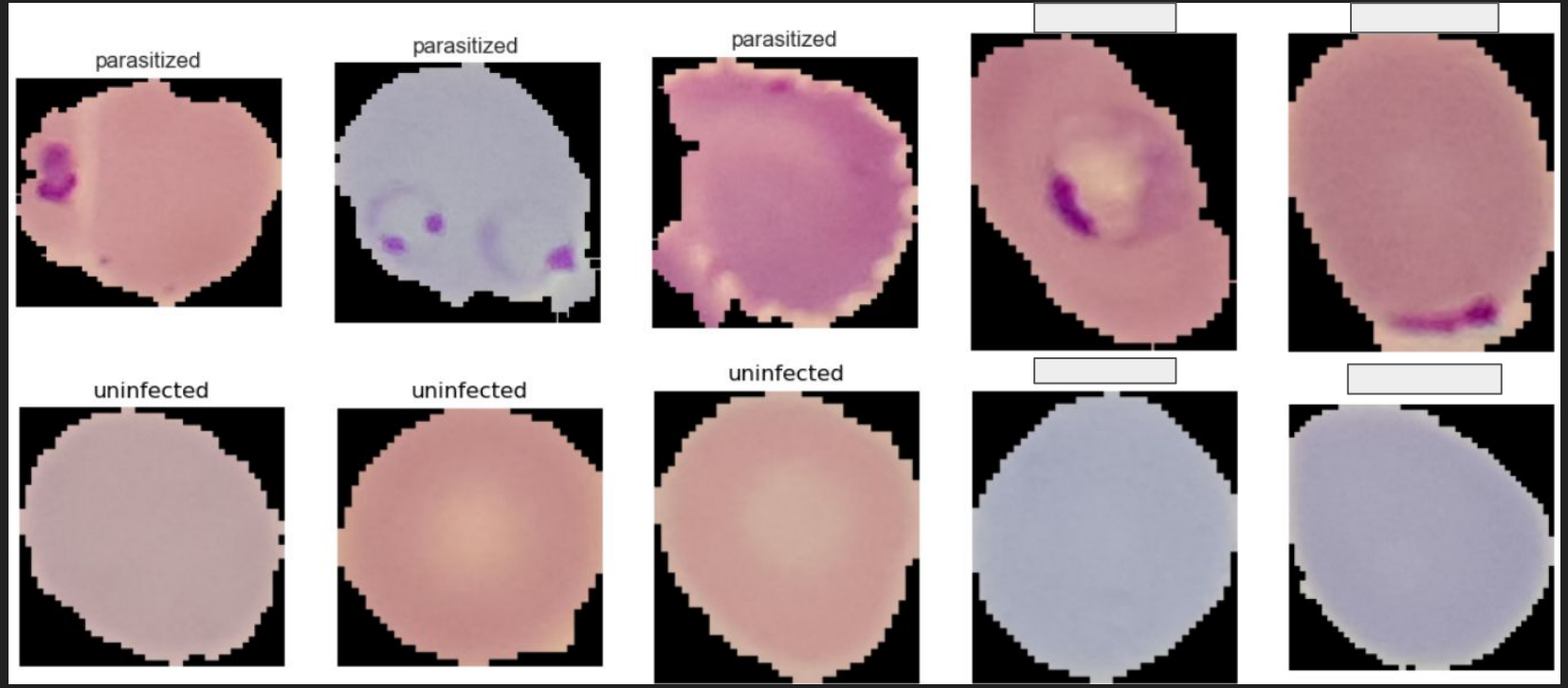
Train: 24,958 images (≅ 90%)
Test: 2,600 images (≅ 10%)

* Source: National Library of Medicine (USA)

Data:

Train

Test



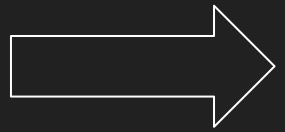
Approach:

1. Comparison of three base models (pre-trained on large amount of images)
2. Fine-tuning of the best model
3. Evaluation of predictions

Key findings:

	model	loss	accuracy
0	Efficient	0.149827	0.959615
1	Resnet	0.243262	0.949231
2	Inception	0.258281	0.910000

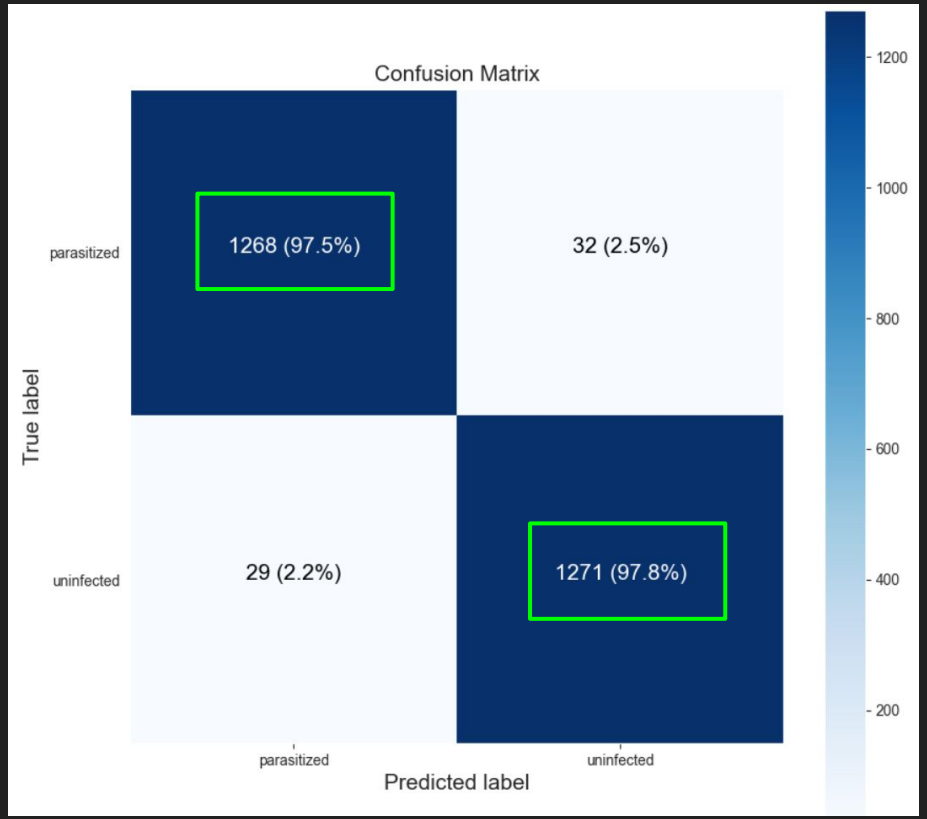
fine-tuning



	model	loss	accuracy
0	Efficient_Base	0.149827	0.959615
1	Efficient_Fine	0.065625	0.976538

After the iterations, the final model showed the near **98% accuracy** on the classification task

Key findings:

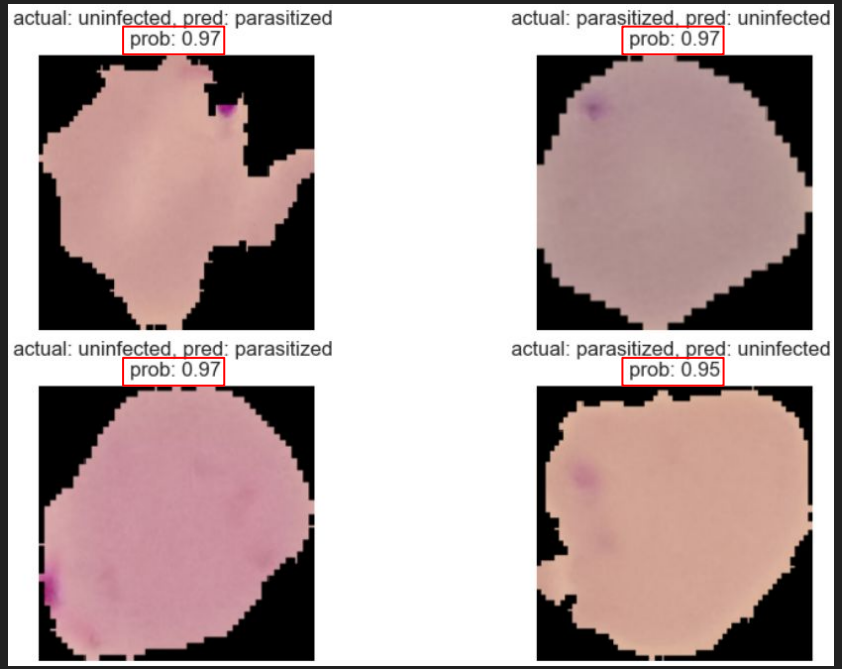


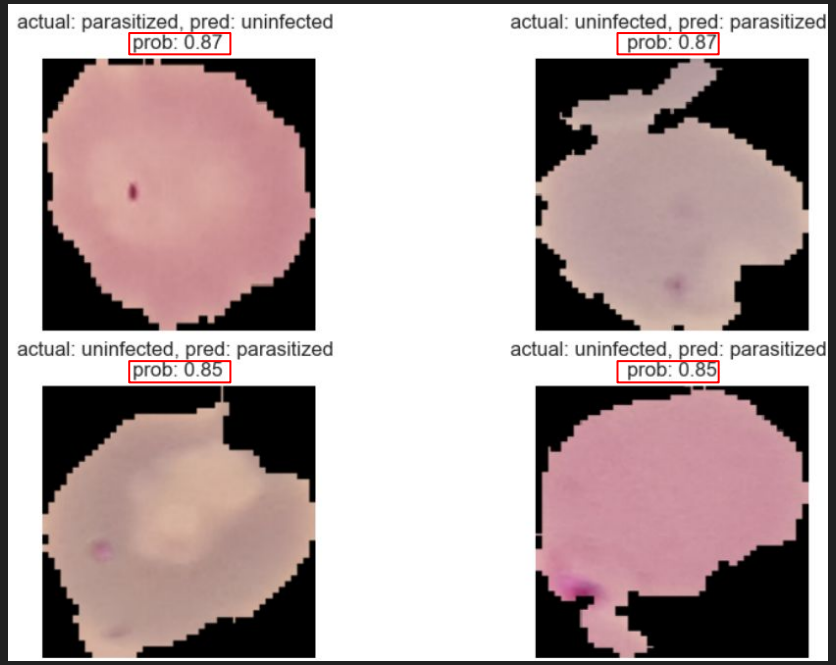
Key findings:

Successfully classified images:

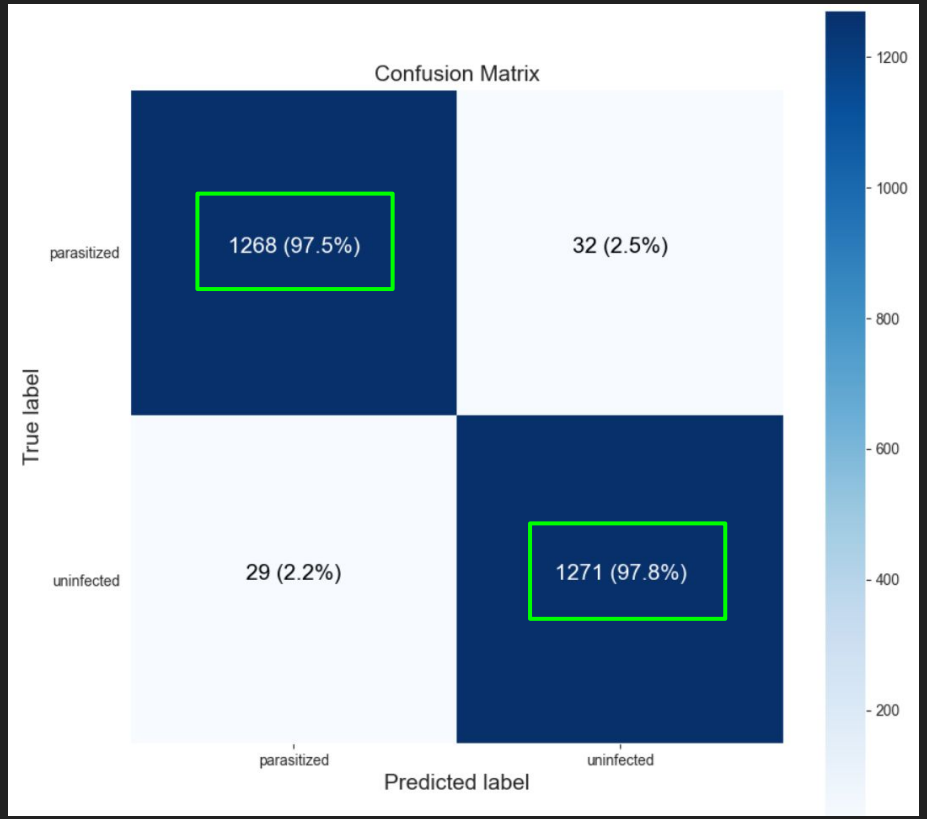
Key findings:

Misclassified images (61 of 2600):





Key findings:



Recommendations:

Feed in **unseen images** to help diagnose malaria (with experts monitoring the performance)

Next steps:

- Further analyse misclassified images
- Use more test data to capture clearer patterns of misclassification
- Monitor model performance over time and make further improvements