Image classification using CNN for Diabetic Retinopathy

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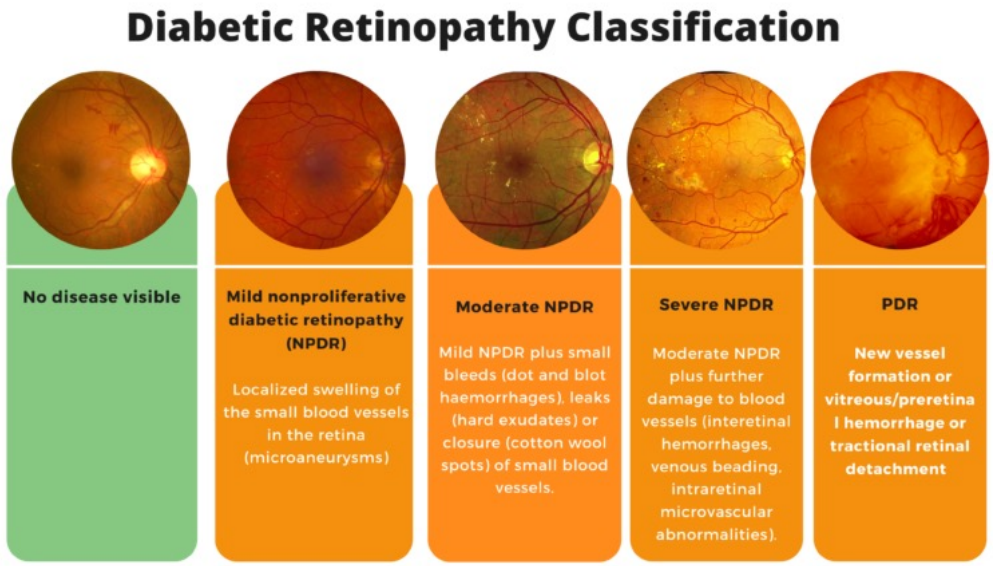
Outline

- Background
- Business Problem
- Data
- Methods
- Results
- Conclusions

Background
What is Diabetic retinopathy?

- Diabetic retinopathy is disease of the eyes
  - Caused by high blood sugar
  - Affects blood vessels
  - Loss of vision
  - Measured by disease proliferation
- Affects people with diabetes
- Found in 4.1 million people
  - roughly 1/29 diabetics
  - 1/3 are African-American and Mexican-American

Background
What is Diabetic retinopathy?



Business Problem

- We are a building a deep learning model to detect the various levels of diabetic retinopathy

Business Problem

Why?

- Medical misdiagnosis caused by varying levels of knowledge and experience.
- Ensuring proper diagnosis for medical professional

Data

- Data is created by TensorFlow
- Contains images 35,000+ images of different levels of diabetic retinopathy.

Methods

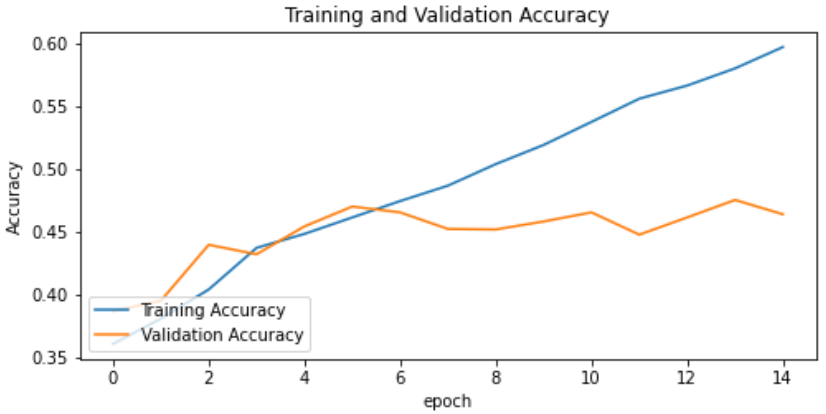
- Images imported from directory
- Baseline model created for comparison
- Model evaluation

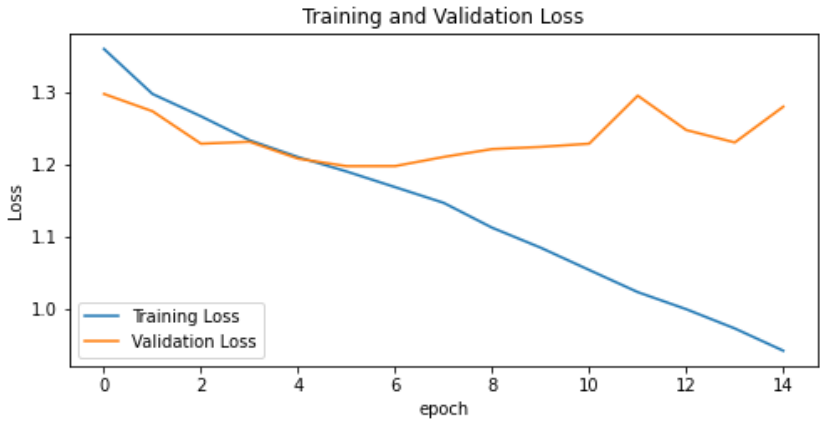
Methods

- Using transfer learning, instantiating pre-trained model as base
- Adding the base model to final model
- Model evaluation

Results

Data Visualization of initial model performance





Results

Data Visualization of model with transfer learning performance

Summary of Findings / Conclusion

- The end accuracy after running the model is 68%
- Overfitting occurs in both models
- Transfer learning greatly improves model performance

Next Steps...

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1) Build Deep Learning models to other ocular diseases (e.g., Diabetic Macular Edema)

2) Pursue other areas of medicine, where we can track disease progression. (e.g., Cancer metastasis)

3) Use Deep learning to build models for disease detection (e.g., Pneumonia)

Thank you!