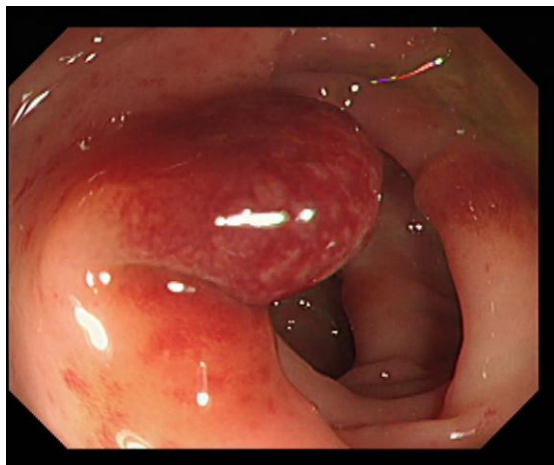




# MEDICAL IMAGE PROJECT

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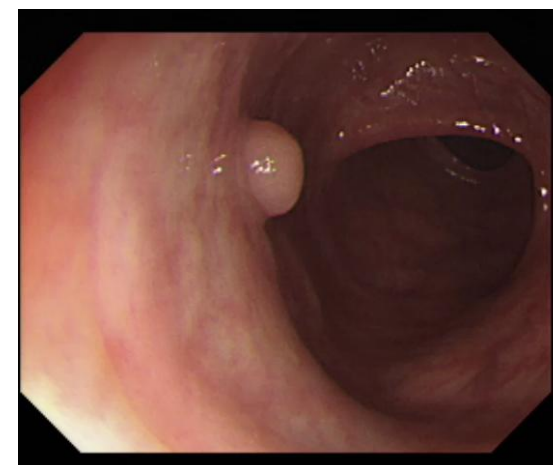
# Overview



Juvenile



Early stage



Adenoma

This is a **classification** problem



# Exploratory data analysis

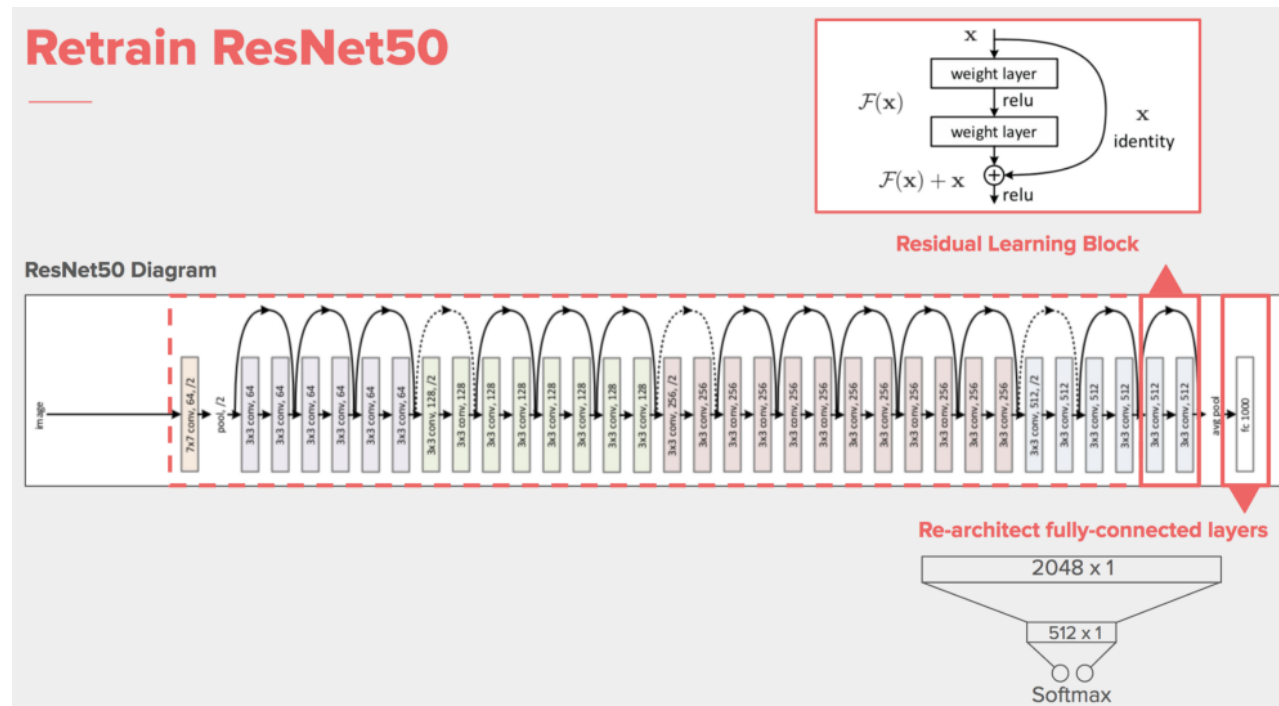
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- Data set: 98 videos -> 4895 images
- Each images contain only one of these 3 labels:
  - Early stage (3340 images)
  - Adenoma (1520 images)
  - Juvenile (35 images)
- The dataset is **highly imbalanced**
- Split the images data into train and test set:
  - Train set: 4405 images (90%)
  - Test set: 490 images (10%)



# Modelling

- Using pre-trained neural network Resnet50 (Due to lack of image data)





# Modelling (cont.)

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- To avoid overfitting, we apply:
  - Convolution layer + Flatten layer
  - Image augmentation:
    - Flip the image
    - Rotate the image
    - Scale the image
    - Crop the image
  - Warmup learning
    - Freeze the 6 last layers, train for 2 epochs
    - Unfreeze, and train until the model converge
  - Schedule learning rate



# Evaluation

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- Using mean F1 score metric (due to imbalance data):
  - First, we calculate F1 score on each label:

$$F1 = 2 * \frac{\text{precision} * \text{recall}}{\text{precision} + \text{recall}}$$

- We achieved:
  - 85.71% for Juvenile
  - 99.55% for early stage
  - 99.34% for adenoma
- The final result is: **94.87%**



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THANK YOU