Classifying different types of blood cells from microscopic images

Johannes Kollek & Jean-Marco Alameddine

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Problem

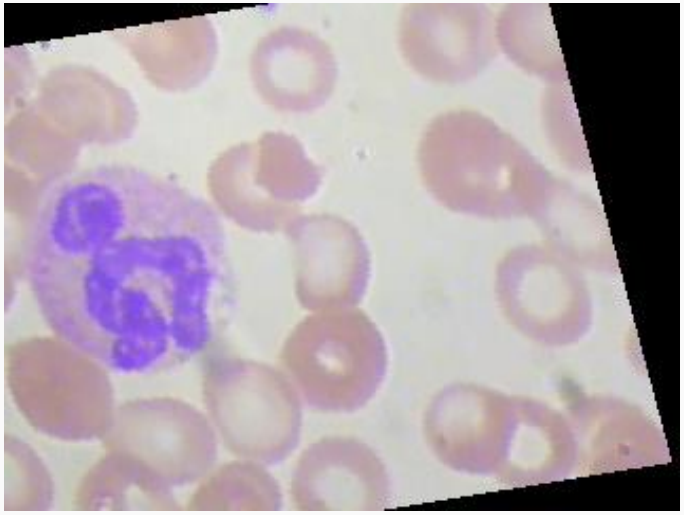
- The task is to distinguish between four different types of white blood cells from microscopic blood test images
- Couting blood cells is an important task in diagnosing diseases
- Manual classification requires technical knowledge and is very time-consuming

$\Rightarrow$ Machine Learning provides an efficient and fast method to solve this task

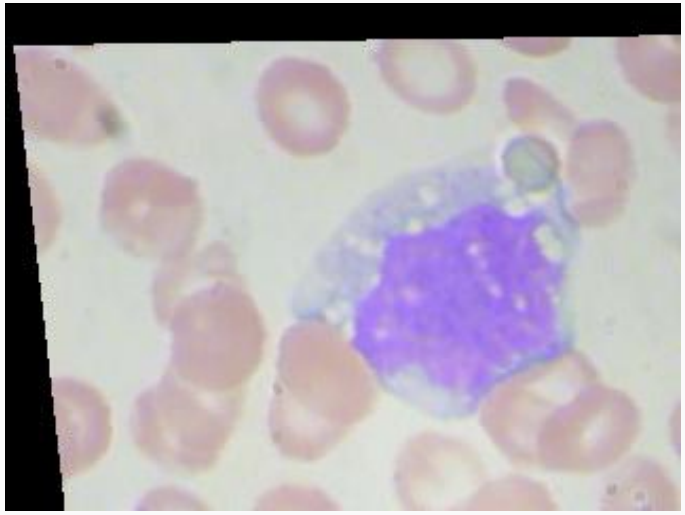
Dataset

- Dataset found on Kaggle, published on `https://github.com/Shenggan/BCCD_Dataset` (MIT license)
- $\approx$ 12500 images including a white blood cell
- Colored 320x240 pixels images
- Four different labels charaterizing the cell (Eosinophil, Lymphocyte, Monocyte, Neutrophil)
- Two kaggle kernels dealing with this specific dataset
- Several papers addressing this problem (with different datasets)

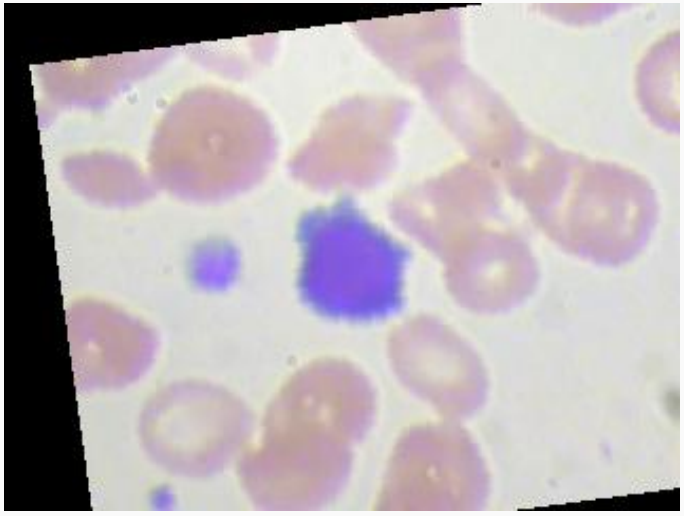
Example images from the dataset



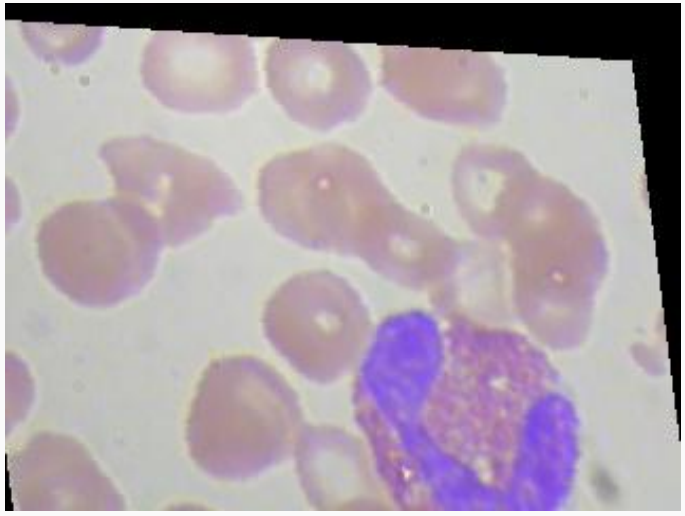
(a) Neutrophil.



(b) Monocyte.



(c) Lymphocyte.



(d) Eosinophil.

Alternative methods

- Using alternative methods to solve the problem...
- ... but the question is: ARE there any alternative methods that are applicable to this problem?
  (Without using an enormous amount of preprocessing)