

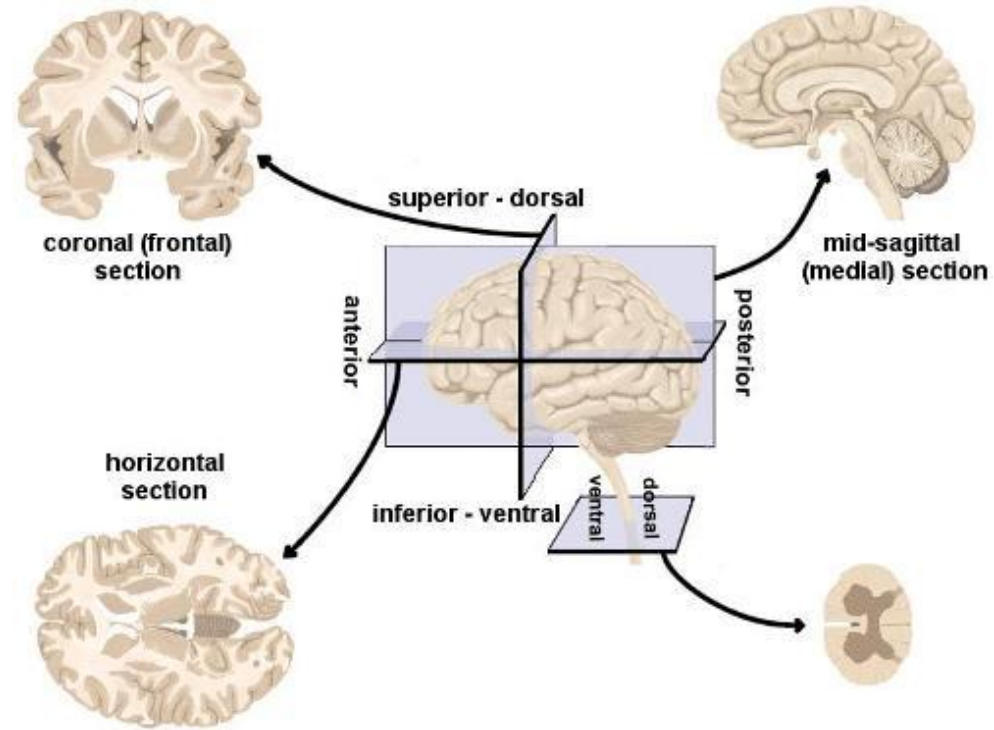
Detecting Brain Tumors With Machine Learning

Presentation by Sam Dedes



What is an MRI?

- Magnetic Resonance Imaging
- 2D Slice of the Brain
- Different Sections and Scan Types



(Technische Universität München, n.d.)

Tumor Detection Model

- Section Agnostic
- Scan Agnostic

Proton Density

Scan Types Include:

- Proton Density
- Transverse Magnetization (1)
- Transverse Magnetization (2)

Transverse Magnetization (2)

Model Type

- Convolutional Neural Network (CNN)

Image Files:

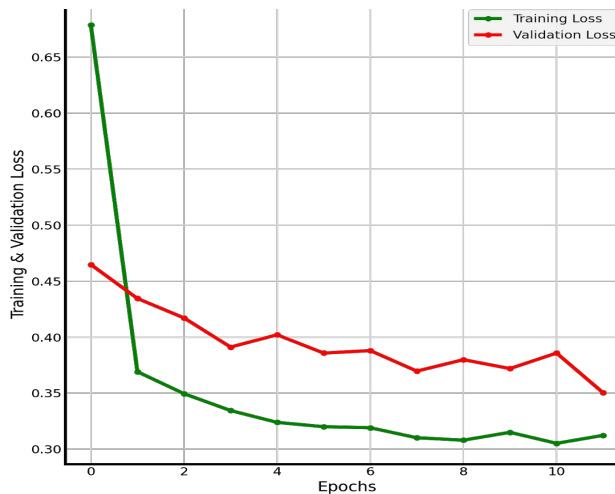
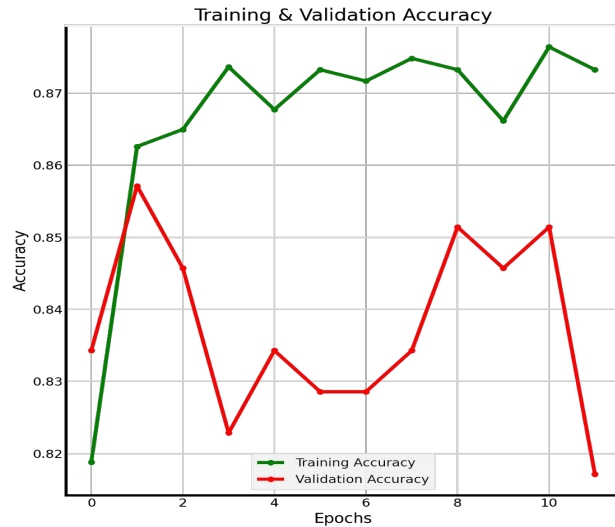
- Represented by pixels
- by Convolution



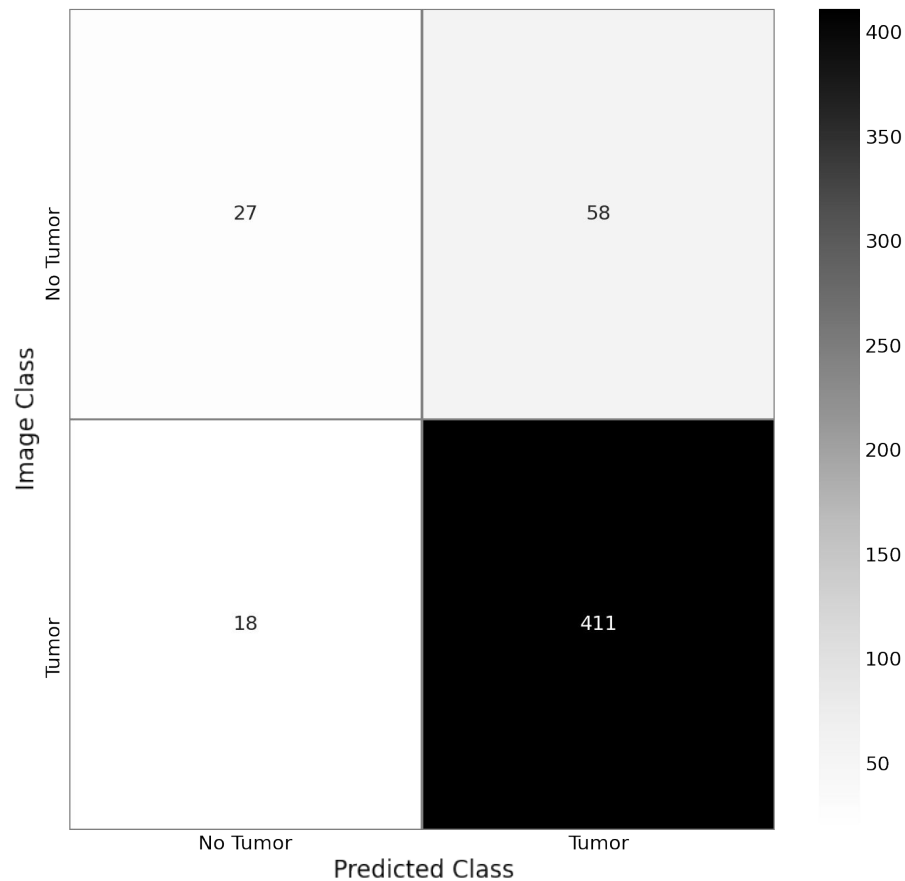
([[Convolutional Neural Network Visualization]], n.d.)

Training the Model

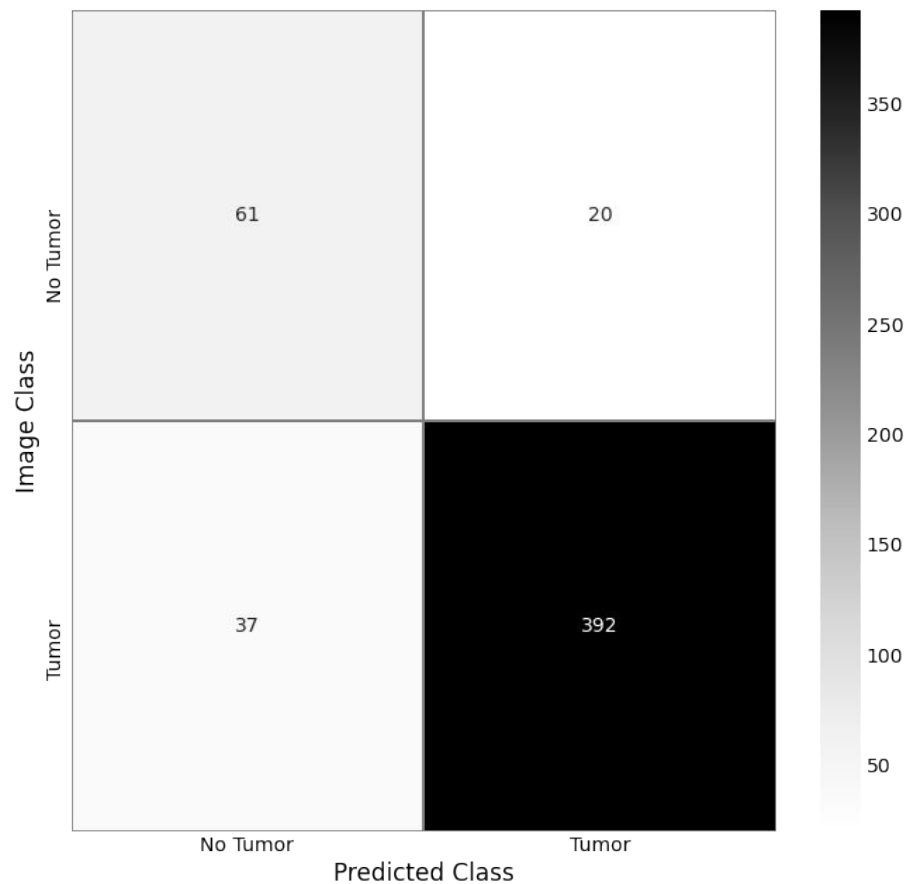
- Increasing accuracy
- Overfitting



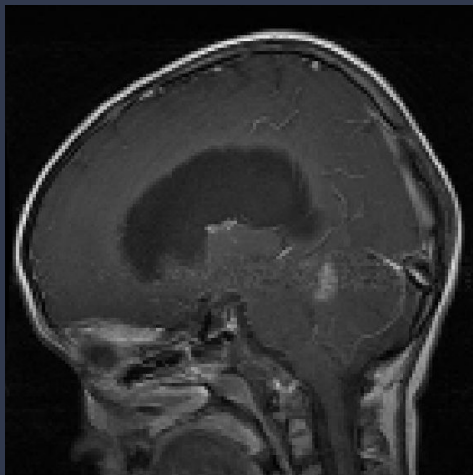
Initial Performance



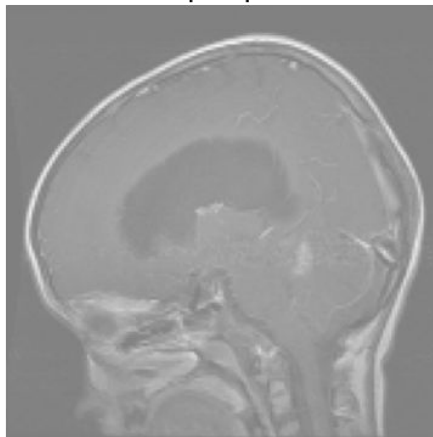
Final Performance



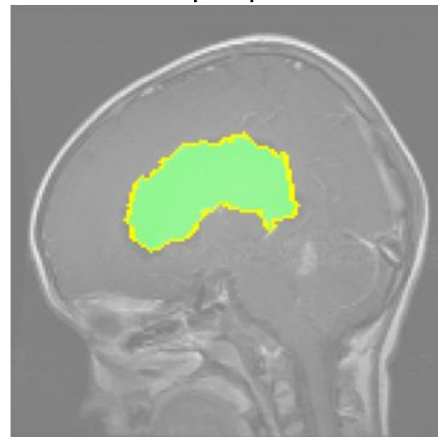
Understanding the Model with LIME



of Superpixels: 0



of Superpixels: 1



Next Steps

Different Analysis to
Understand Model
Layers, Lime Features

Different Model Features/
Types to Improve Accuracy

Github: https://github.com/samjdedes/MRI_brain_scan_tumor_detection
Email: samjdedes@gmail.com

References

- Technische Universität München. (n.d.). *Planes of the Brain*
[Illustration]. [https://Wiki.Tum.De/](https://wiki.tum.de/).
https://wiki.tum.de/download/attachments/29600620/Brain_directions_planes_sections_1_small.gif?version=1&modificationDate=1494257234627&api=v2
- [Convolutional Neural Network Visualization]. (n.d.). Gfycat.
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