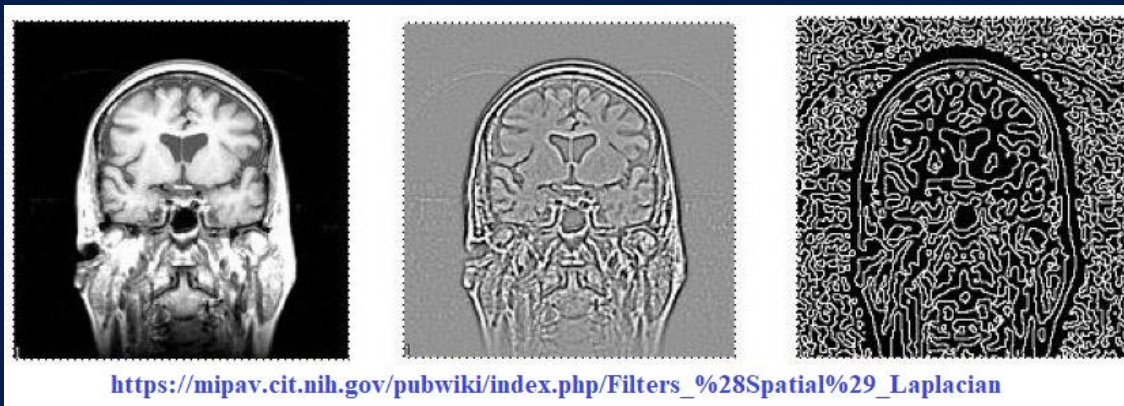
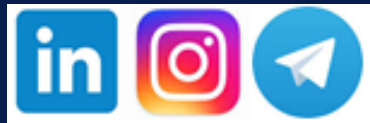


Radiomics

PyRadiomics Filters



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Texture Features

- **First Order Statistics (19 features)**
- **GLCM (24):** Grey Level Co-occurrence Matrix
- **GLRLM (16):** Grey Level Run Length Matrix
- **GLSZM (16):** Grey Level Size Zone Matrix
- **NGTDM (5):** Neighbouring Grey Tone Difference Matrix
- **GLDM (14):** Grey Level Dependence Matrix

pyradiomics Documentation, Release v3.0.1.post15+g2791e23



Image Types

- **Original:** No filter applied
- **Wavelet:** Wavelet filtering
- **LoG:** Laplacian of Gaussian filter
- **Gradient:** Returns the magnitude of the local gradient.
- **Logarithm, Square, SquareRoot, Exponential**
- **LocalBinaryPattern**

pyradiomics Documentation, Release v3.0.1.post15+g2791e23

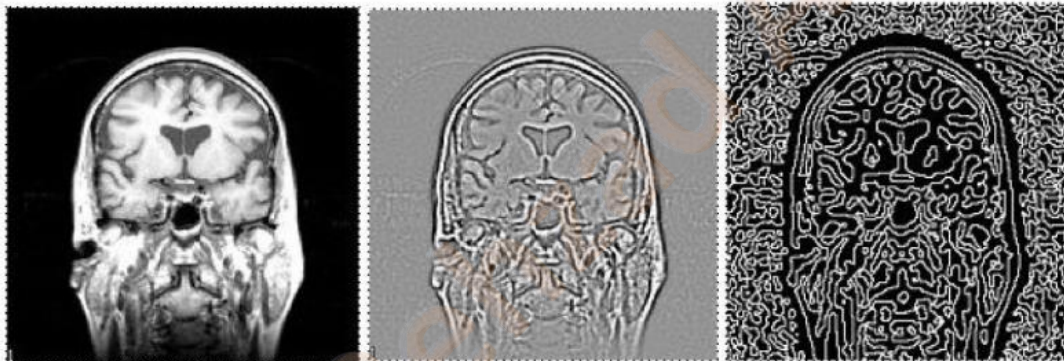
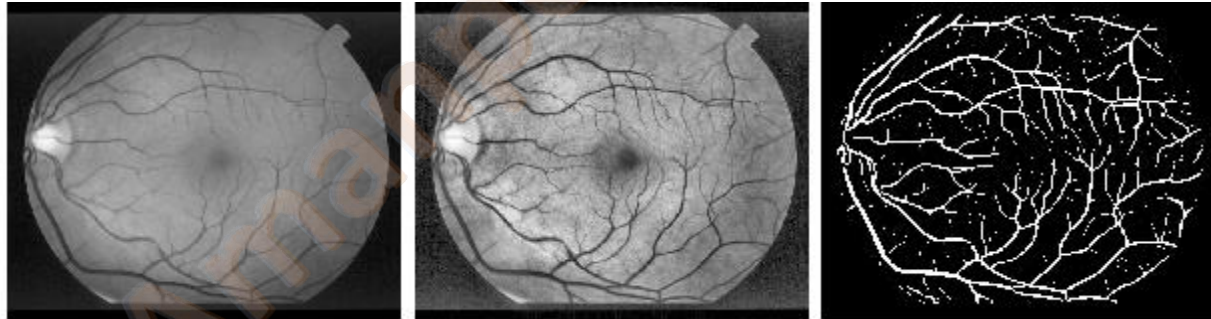
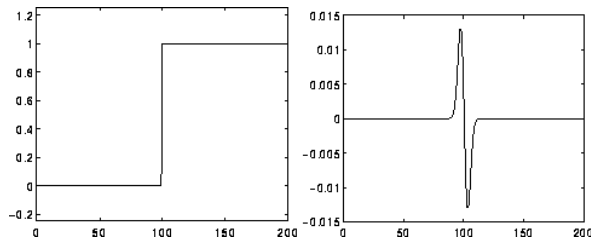


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Laplacian of Gaussian

- Edge Enhancement Filter



[https://mipav.cit.nih.gov/pubwiki/index.php/Filters %28Spatial%29 Laplacian](https://mipav.cit.nih.gov/pubwiki/index.php/Filters_%28Spatial%29_Laplacian)

<https://www.semanticscholar.org/paper/Retinal-blood-vessel-segmentation-using-matched-and-Kumar-Pramanik>

<https://homepages.inf.ed.ac.uk/rbf/HIPR2/log.htm>



Laplacian of Gaussian

- Setting for sigma must be provided. Otherwise, no LoG image features are calculated.
- **Sigma:** Filter width (mm) to use for the Gaussian kernel
List of **floats or integers (greater than 0)**.
 - **Small number:** edge detection
 - **Large number:** noise reduction

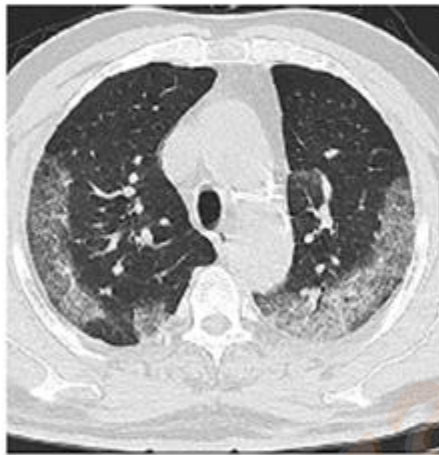
pyradiomics Documentation, Release v3.0.1.post15+g2791e23



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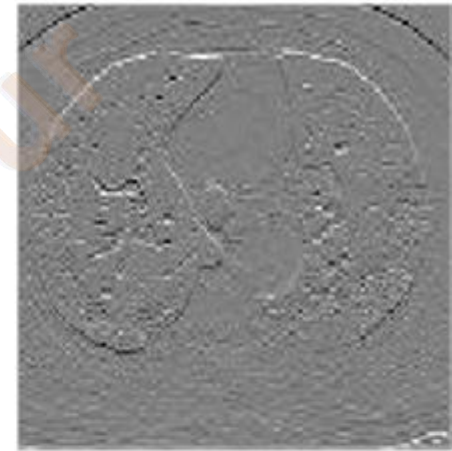
Wavelet



(a) Plain CT image



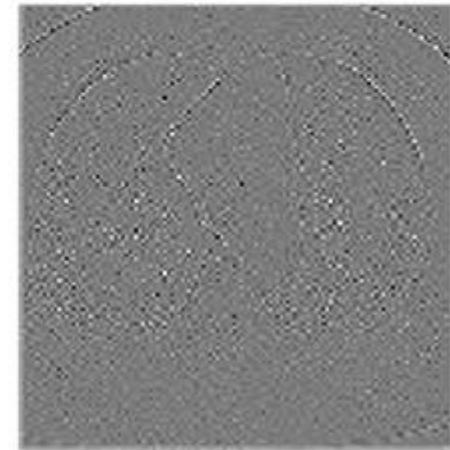
(b) LL sub-band



(c) LH sub-band



(d) HL sub-band



(e) HH sub-band



Wavelet

- Yields **8 decompositions per level** (all possible combinations of applying either a High or a Low pass filter in each of the three dimensions)
- **level**: integer, number of levels of wavelet.
- **wavelet**: string, type of wavelet

haar, dmey, sym[2-20], db[1-20], coif[1-5], bior, rbio

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Filter Settings

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