Title of the document

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Writing Equations

This is how we can type labelled equations

$$\hat{H}\psi(\mathbf{r}) = E\psi(\mathbf{r}) \quad (1)$$

For writing simple math stuff without numbering we can use $GT = \{gt\}$, $SEG = \{seg\}$ are two sets of segmented objects.

Writing Code

For writing code we can do it like this

```
def WatershedwithMask3D(Image, Label, mask, gr:
  properties = measure.regionprops(Label, Image,
  binaryproperties =
  measure.regionprops(label(mask), Image)
  Coordinates = [prop.centroid for prop in properties]
  BinaryCoordinates = [prop.centroid for
  prop in binaryproperties]
  Binarybbox =
  [prop.bbox for prop in binaryproperties]
  Coordinates = sorted(Coordinates ,
  key=lambda k: [k[0], k[1], k[2]])

  if len(Binarybbox) > 0:
       for i in range(0, len(Binarybbox)):

          box = Binarybbox[i]
          inside = [iou3D(box, star)
          for star in Coordinates]

          if not any(inside) :
                Coordinates.append(BinaryCoordinates[i])


  Coordinates.append((0,0,0))
  Coordinates = np.asarray(Coordinates)
  coordinates_int = np.round(Coordinates).astype(int)

  markers_raw = np.zeros_like(Image)
  markers_raw[tuple(coordinates_int.T)] = 1
  + np.arange(len(Coordinates))
  markers = morphology.dilation(
  markers_raw.astype('uint16'), morphology.ball(2))
```

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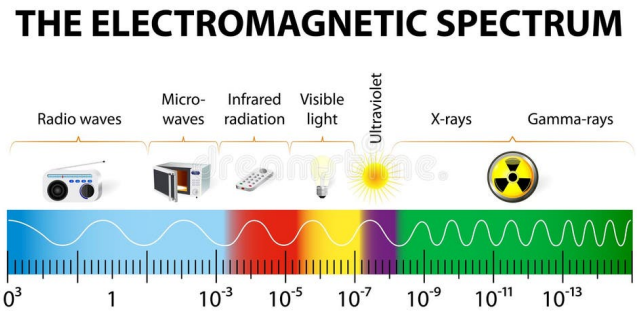

Fig. 1: *Schematic representation showing the radiation spectrum with decreasing wavelength (in meters) from left to right, radio waves have wavelength of kilometers (that is what it needs to be in our houses from a transmitter tower), microwaves of about 5 cm (easy guess as the size of the box itself is about 15 cm or so) while the visible radiation is 400-800 nano meter.*

radiation

```
  watershedImage = watershed(-Image, markers,
  mask = mask.copy())
  return watershedImage, markers
```

Putting a figure

For adding a figure it is like

Then we can refer to the figure by saying is shown in the Figure radiation

Citing People

[SWBM18] [WSH+20] [BM18] [RFB15] [WCV+20] [ESC+18]

References

[BM18] S. Beucher and F. Meyer. The morphological approach to segmentation: The watershed transformation. 2018. doi:10.1201/9781482277234-12.

[ESC+18] Dennis Eschweiler, Thiago V. Spina, Rohan C. Choudhury, Elliot Meyerowitz, Alexandre Cunha, and Johannes Stegmaier. Cnn-based preprocessing to optimize watershed-based cell segmentation in 3d confocal microscopy images, 2018. arXiv:1810.06933, doi:10.1109/isbi.2019.8759242.

[RFB15] Olaf Ronneberger, Philipp Fischer, and Thomas Brox. U-net: Convolutional networks for biomedical image segmentation. In Nassir Navab, Joachim Hornegger, William M. Wells, and Alejandro F. Frangi, editors, *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2015*, pages 234–241, Cham, 2015. Springer International Publishing.

[SWBM18] Uwe Schmidt, Martin Weigert, Coleman Broaddus, and Gene Myers. Cell detection with star-convex polygons. In *Medical Image Computing and Computer Assisted Intervention - MICCAI 2018 - 21st International Conference, Granada, Spain, September 16-20, 2018, Proceedings, Part II*, pages 265–273, 2018. doi:10.1007/978-3-030-00934-2_30.

[WCV+20] Adrian Wolny, Lorenzo Cerrone, Athul Vijayan, Rachele Tofanelli, Amaya Vilches Barro, Marion Louveaux, Christian Wenzl, Susanne Steigleder, Constantin Pape, Alberto Bailoni, Salva Duran-Nebreda, George Bassel, Jan U. Lohmann, Fred A. Hamprecht, Kay Schneitz, Alexis Maizel, and Anna Kreshuk. Accurate and versatile 3d segmentation of plant tissues at cellular resolution. *bioRxiv*, 2020. arXiv:https://www.biorxiv.org/content/early/2020/01/18/2020.01.17.910562.full.pdf, doi:10.1101/2020.01.17.910562.

[WSH+20] Martin Weigert, Uwe Schmidt, Robert Haase, Ko Sugawara, and Gene Myers. Star-convex polyhedra for 3d object detection and segmentation in microscopy. In *The IEEE Winter Conference on Applications of Computer Vision (WACV)*, March 2020. doi:10.1109/WACV45572.2020.9093435.