News
8.3.2023.

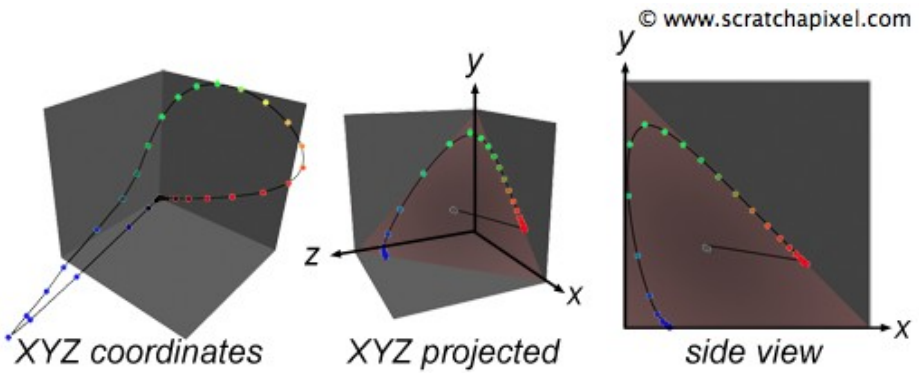
Perspective problems for object detection

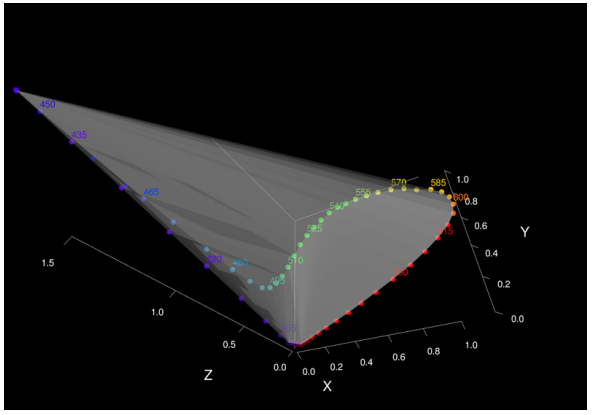
- Problem: model trained on top-down view fails when view changes → perspective distortion
- Solutions:
  - Always **augment your dataset** with imperfections and distortions to make model more robust on changes. Library: https://albumentations.ai/
    - This way perspective distortions can be learned and changes in view shouldn't affect results drastically: https://albumentations.ai/docs/getting_started/keypoints_augmentation/
    - Besides viewpoint distortions, wide range of other distortions such as color and noise are always good to have in dataset: https://www.v7labs.com/blog/data-augmentation-guide
  - Use OpenCV for feature-based image alignment:
    - https://opencv.org/
    - https://learnopencv.com/image-alignment-feature-based-using-opencv-c-python/
- General tips:
  - Keep it plausible (decide what to use depending on what can and will happen)
  - Keep it simple and fast (save time and energy)
  - Keep your eyes on the goal (solve only the bare minimum you need for the task, you can upgrade later if needed)

Acknowledgments:
Thanks to Juraj Fulir
https://www.itwm.fraunhofer.de/de/abteilungen/bv/mitarbeiter/juraj-fulir.html

Visualizing XYZ color space

- Each color in the range 380 to 700 (from the visible spectrum) is converted into an XYZ color using the color matching functions. These can be plotted in a 3D Cartesian coordinate system.





https://www.scratchapixel.com/lessons/digital-imaging/colors/color-space.html
https://fmiranda.me/projects/color-gamut/
https://ninedegreesbelow.com/photography/xyz-rgb.html
https://www.youtube.com/watch?v=x0-qoXOCOow&ab_channel=JeremySelan
https://github.com/mittimithai/colorspacegraphs/blob/master/XYZ.png

Projects and exam

- Exam: **29.3.2023.** at 16h, Raum 136.1B
- Projects deadline: **8.4.2023**, 23:59
- Questions?