The use of neural networks for medical applications has increased in recent years [1], [2]. With newer and more interesting applications being developed, such as the use of generative adversarial networks for the reconstruction of histological images [1].

Segmentation and object detection was the third most popular task with almost a 3-fold increase between 2018 and 2022 [2]

Due to the large size of the wsi histology images, a compression must be made to increase the efficiency and reduce both the storage size and inference time of neural network models [3]. It has been shown that downsampling of 16x can actually improve the precision of object detection models while slightly lowering recall on renal WSI histology images [3] with the optimal downsampling being at 8x. It has also been shown that compression is a available option for further downsizing the high resolution images [3] with an optimal rate of 40%. It was also shown that lower resolution images can be beneficial for the performance of segmentation models [4].

glass histology slide into a Whole Slide Image

Bibliography

[1] F. M. Howard *et al.*, “Generative adversarial networks accurately reconstruct pan-cancer histology from pathologic, genomic, and radiographic latent features,” *Sci. Adv.*, vol. 10, no. 46, p. eadq0856, Nov. 2024, doi: 10.1126/sciadv.adq0856.

[2] Y. Ma, S. Jamdade, L. Konduri, and H. Sailem, “AI in Histopathology Explorer for comprehensive analysis of the evolving AI landscape in histopathology,” *Npj Digit. Med.*, vol. 8, no. 1, p. 156, Mar. 2025, doi: 10.1038/s41746-025-01524-2.

[3] C. Peng *et al.*, “To What Extent Does Downsampling, Compression, and Data Scarcity Impact Renal Image Analysis?,” in *2019 Digital Image Computing: Techniques and Applications (DICTA)*, Dec. 2019, pp. 1–8. doi: 10.1109/DICTA47822.2019.8945813.

[4] J. Li, A. Osseyran, R. Hekster, S. Rudinac, V. Codreanu, and D. Podareanu, “Improving the speed and quality of cancer segmentation using lower resolution pathology images,” *Multimed. Tools Appl.*, vol. 83, no. 4, pp. 11999–12015, Jan. 2024, doi: 10.1007/s11042-023-15984-9.