

Augmenting LIDC Dataset Using 3D Generative Adversarial Networks to Improve Lung Nodule Detection

- 2019
- code on github
- link <https://arxiv.org/pdf/1904.05956.pdf>
- adopted Wasserstein GAN
- adopted CNN model from this paper
<https://www.researchgate.net/publication/323440759Lungnodule detection from CT scans using 3D convolutional>
(Access restricted unfortunately)
- results: (The number of FP seems pretty weird which is explained in paper as that real FP rate has been multiplied with (total FP number / total TP number), and that also seems strange because in RPN for example this asymptotically equal to FP^2 (TP is always $O(1)$ per image))

FPs	Experiments				
	Control	30% Augmented	50% Augmented	100% Augmented	200% Augmented
0-100	0.300 (79)	0.477* (20)	0.563 (18)	None	None
100-200	0.706 (68)	0.734 (77)	0.763 (84)	0.840* (45)	0.847 (27)
200-300	0.848 (74)	0.889* (90)	0.917* (82)	0.933 (98)	0.950* (80)
300-400	0.966 (172)	0.968 (155)	0.963 (159)	0.980* (158)	0.981 (190)
400-500	0.997 (456)	0.998* (507)	0.997* (506)	0.999* (545)	0.999* (553)
500-600	1.000 (1)	1.000 (1)	1.000 (1)	1.000 (4)	None

CT-GAN: Malicious Tampering of 3D Medical Imagery using Deep Learning

- 2019
- code on github
- provides nodule injection / removal framework
- no training or evaluation of lung nodule detection have been performed
- used conditional GANs (No more specific information about model did I manage to get from the paper)
- link: https://www.usenix.org/system/files/sec19-mirsky_0.pdf

Synthesizing Diverse Lung Nodules Wherever Massively: 3D Multi-Conditional GAN-based CT Image Augmentation for Object Detection

- 2019
- did not find code on github
- link: <https://arxiv.org/pdf/1906.04962.pdf>
- adopted Multi-Conditional GAN
- adopted 3d Faster RCNN
- results (look less weird than in the first work):

	CPM	CPM by Size			CPM by Attenuation		
		Small	Medium	Large	Solid	Part-solid	GGN
632 real images	0.518	0.447	0.618	0.624	0.655	0.464	0.242
+ 1× 3D MCGAN-based DA	0.550	0.452	0.683	0.662	0.699	0.521	0.244
+ 2× 3D MCGAN-based DA	0.527	0.447	0.674	0.429	0.655	0.407	0.289
+ 3× 3D MCGAN-based DA	0.512	0.411	0.644	0.662	0.616	0.579	0.277
+ 1× 3D MCGAN-based DA w/ ℓ_1	0.508	0.430	0.633	0.556	0.626	0.471	0.271
+ 2× 3D MCGAN-based DA w/ ℓ_1	0.509	0.406	0.644	0.654	0.649	0.436	0.233
+ 3× 3D MCGAN-based DA w/ ℓ_1	0.479	0.389	0.594	0.617	0.596	0.507	0.226

