Explainable Image Quality Analysis of Chest X-Rays

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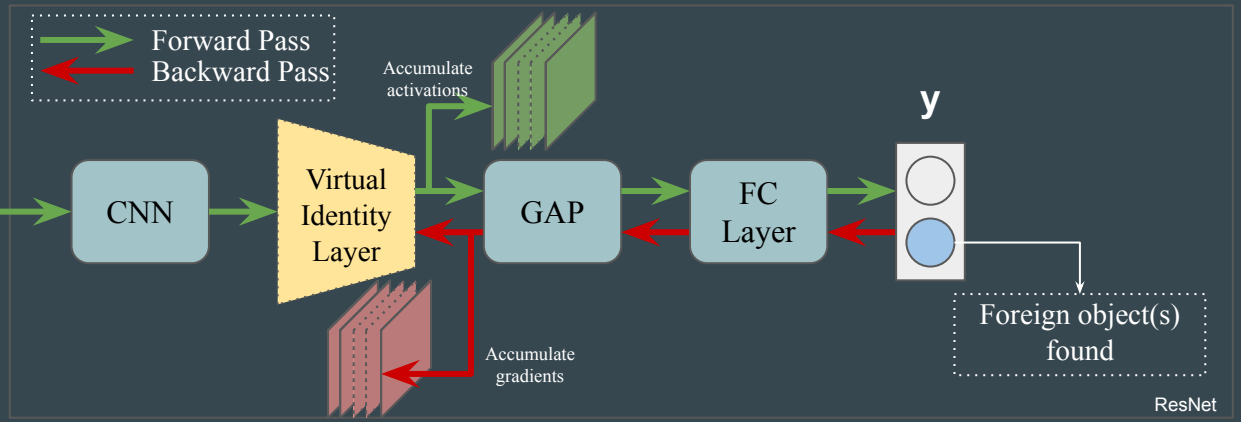
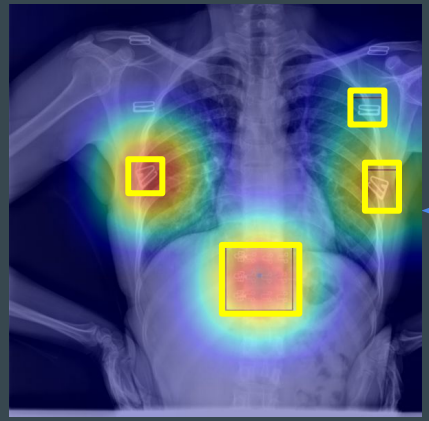
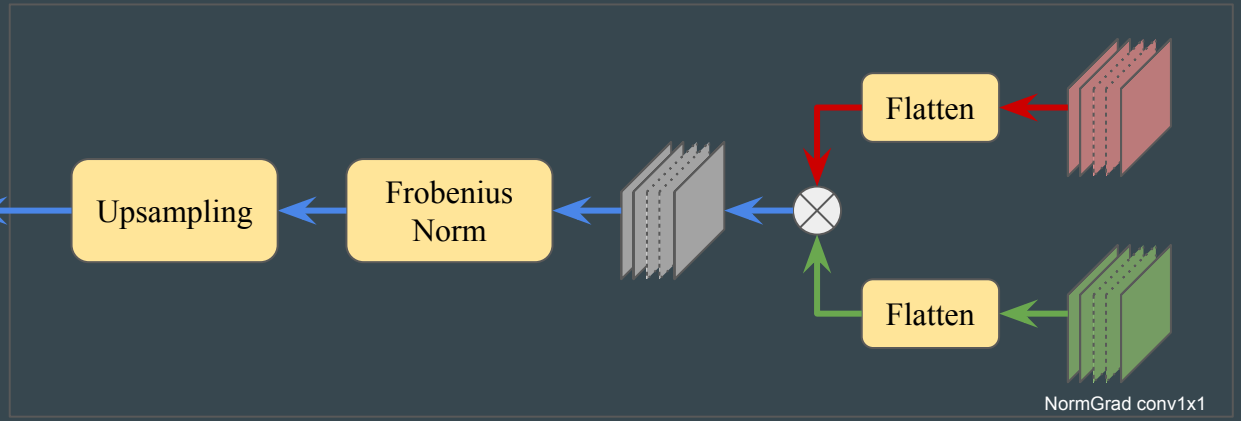
Motivation

- Accelerating image acquisition procedure by proposing an automated foreign object classification system on Chest X-Rays
- Ensuring that the whole system is interpretable for a potential clinical translation
- Verifying the interpretation method is accurate and using the ground truth bounding box annotations for only evaluation purposes

Methodology

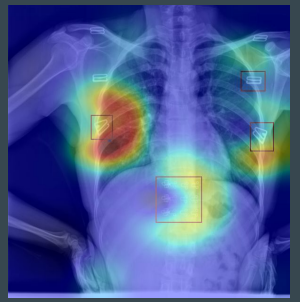






Comparison with Baseline Models

Method	Object-CXR Val	Object-CXR Test
Input x Gradient (Shrikumar et al., ICML'17)	0.246	0.24
Guided Backpropagation (Springenberg et al., ICLR'15)	0.208	0.188
Guided Grad-CAM (Selvaraju et. al., IJCV'20)	0.348	0.334
Grad-CAM (Selvaraju et. al., IJCV'20)	0.684	0.656
NormGrad (conv4.2, conv3x3) (Rebuffi et. al., CVPR'20)	0.874	**0.862**
NormGrad (Combined, conv3x3) (Rebuffi et. al., CVPR'20)	**0.88**	0.85



Grad-CAM

NormGrad