Extension of the Disease Detection Method of Lung Using Deep Learning with Visualization

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One day my family suddenly faced on “cancer” when my grandfather had serious lung cancer. I wished so much to save him if it was possible. I expect there would be better way to detect the early stage cancers. The X-ray examination is used on health check. Then, I selected diagnosis using X-ray images as my theme. I built a diagnostic system based on deep learning to predict possible diseases, and applied it to 110,000 chest X-ray image data set published by NIH. The unlearned image data were input to the system to verify its diagnostic performance. As a result, images of potential diseases have been identified automatically. Estimation results enabled to visualize heat maps and some abnormal shadows of chest X-ray images could be observed. I compared some abnormal shadows found by doctors with the output. I found that the shooting conditions of the data were bad, which caused some images difficult to be identified. By eliminating such poor image data advised by doctors, I may obtain more accurate results. It is desirable for ‘advanced cancers’ to use CT or MRI. However I wish the X-ray image diagnosis would be effective for “early stage cancers”.

Awards Won: