Classification of Chest X-ray

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Our team proposes to use the techniques we’ve learned in class to construct a neural network solution to classify Chest X-Ray images. Toward these ends, we’ve found a Kaggle Dataset[[1]](#footnote-0) which is a 2GB random sample of a 42GB collection of images[[2]](#footnote-1). Our initial plan is to build up a Convolutional Neural Network (CNN) to perform the classifications, though we will need to adjust the network design from class to account for the multi-label classification target. We’ve begun doing some initial research into modifying a CNN design to account for multi-label outputs. For starters, this appears to involve changing the activation function for the final layer[[3]](#footnote-2) of the network, but further research will be required. Though our team has little experience with the PyTorch framework, we’ve decided to try it, as we’ve been led to believe it has more flexibility with CNNs. Based on our initial research, due to our change to the final activation function, it will likely be better to use Binary Cross Entropy instead of Categorical Cross Entropy as our Performance Index, but that may change as we investigate multi-label classification problem solving techniques further.

## Schedule

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| Date | Milestone | Description |
| 11/11/19 | Topic Selection Complete | Have Selected Topic |
| 11/11/19 | Group Proposal Submitted | Have Submitted Group Proposal |
| 11/17/19 | MVP Complete | Have Minimum Viable Product (MVP)   * Initial Preprocessing/Train/Eval Pipeline |
| 11/24/19 | Product Refinement | Refined Software Product   * Implement Several Improvements |
| 12/01/19 | Presentation/Paper | Complete Rough Presentation/Paper |
| 12/7/19 | Documentation | Individual Papers, Comment Clean-up, etc... |
| 12/8/19 | Final Project Submitted | Submit Final Project in Whole |
| 12/9/19 | Final Project Due | Final Project Submission Due |

1. <https://www.kaggle.com/nih-chest-xrays/sample> [↑](#footnote-ref-0)
2. <https://www.kaggle.com/nih-chest-xrays/data> [↑](#footnote-ref-1)
3. <https://towardsdatascience.com/multi-label-image-classification-with-neural-network-keras-ddc1ab1afede> [↑](#footnote-ref-2)