

## **Distinguishing Biological Noise in Cellular Images with a Focus on Explainability**

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**Abstract :** The cost of some drugs and medical treatments has risen in recent years, that many patients are having to go without. A classification project could make researchers more efficient. One of the more surprising reasons behind the cost is how long it takes to bring new treatments to market. Despite improvements in technology and science, research and development continues to lag. In fact, finding new treatment takes, on average, more than 10 years and costs hundreds of millions of dollars. If successful, we could dramatically improve the industry's ability to model cellular images according to their relevant biology. In turn, greatly decreasing the cost of treatments and ensure these treatments get to patients faster. This work aims at solving a part of this problem by creating a cellular image classification model which can decipher the genetic perturbations in cell (occurring naturally or artificially). Another interesting question addressed is what makes the deep-learning model decide in a particular fashion, which can further help in demystifying the mechanism of action of certain perturbations and paves a way towards the explainability of the deep-learning model.

**Keywords :** cellular images, genetic perturbations, deep-learning, explainability

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