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Detecting Manual Alterations in Biological Image Data Using Contrastive Learning and Pairwise Image Comparison

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In this paper, we address the problem of detecting manipulations in biological images. Ensuring the integrity of biological image data is essential for reliable scientific research. The study focuses on developing a model for pairwise image comparison using contrastive learning, demonstrating high pairwise comparison metrics to detect manual modifications or more subtle alterations. The proposed method outperforms state-of-the-art models, including SimCLR and Barlow Twins, in the task of biological image comparison on complex cell datasets. This work contributes to automated fraud detection and data validation in biological research.

Primary authors: Mr HRABOVIY, Andrii (Candidate of Physico-mathematical Sciences); Mr DORIN, Daniil; NEKHOROSHKOV, George

Presenter: NEKHOROSHKOV, George

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