

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

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Какая проблема решается

- использование снимков без разрешения
- заимствования из статей
- фабрикация результатов

RETRACTION

doi:10.1038/nature13598

Retraction: Stimulus-triggered fate conversion of somatic cells into pluripotency

Haruko Obokata, Teruhiko Wakayama, Yoshiki Sasai, Koji Kojima, Martin P. Vacanti, Hitoshi Niwa, Masayuki Yamato & Charles A. Vacanti

Nature **505**, 641–647 (2014); doi:10.1038/nature12968

Several critical errors have been found in our Article and Letter (<http://dx.doi.org/10.1038/nature12969>), which led to an in-depth investigation by the RIKEN Institute. The RIKEN investigation committee has categorized some of the errors as misconduct (see Supplementary Data 1 and Supplementary Data 2). Additional errors identified by the authors that are not discussed in RIKEN's report are listed below.

(1) Figure 1a and b in the Letter both show embryos generated from STAP cells, not a comparison of ES- and STAP-derived chimaeric embryos, as indicated in the legend.

(2) Extended Data Fig. 7d in the Article and Extended Data Fig. 1a in the Letter are different images of the same embryo and not, as indicated in the legends, a diploid chimaera embryo and tetraploid chimaera embryo.

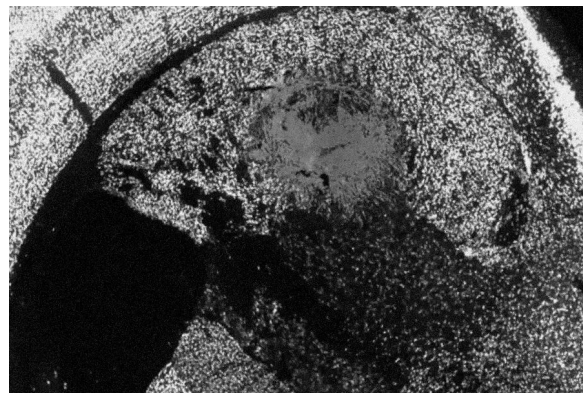
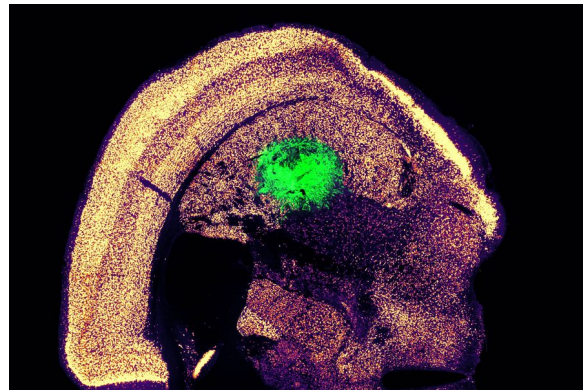
(3) There is an erroneous description in Fig. 1a in the Letter. The right panel of Fig. 1a is not a 'long exposure' image at the camera level but a digitally enhanced one.

(4) In Fig. 4b of the Letter, STAP cell and ES cell are wrongly labelled in a reverse manner.

Постановка задачи

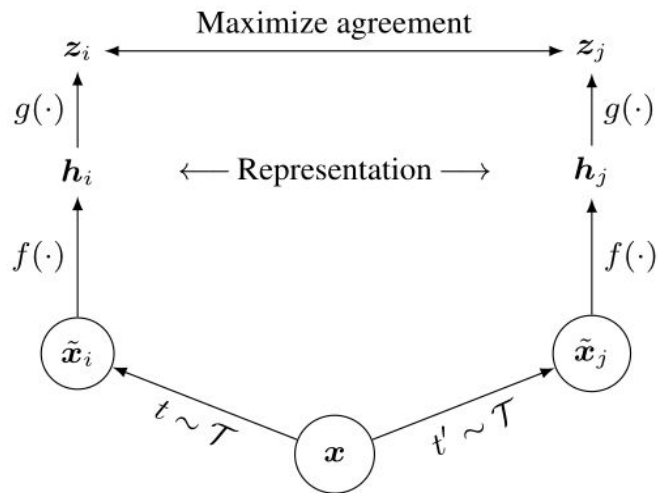
требуется разработать модель для обнаружения совпадений в паре изображений, устойчивую к множеству модификаций

Сложность – визуальное сходство сканов объектов одного вида



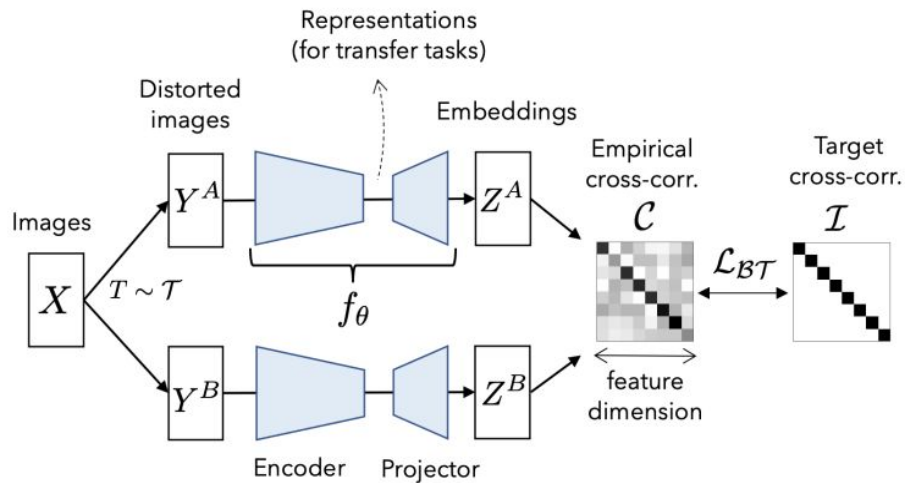
Существующие решения

SimCLR



<https://doi.org/10.48550/arXiv.2002.05709>

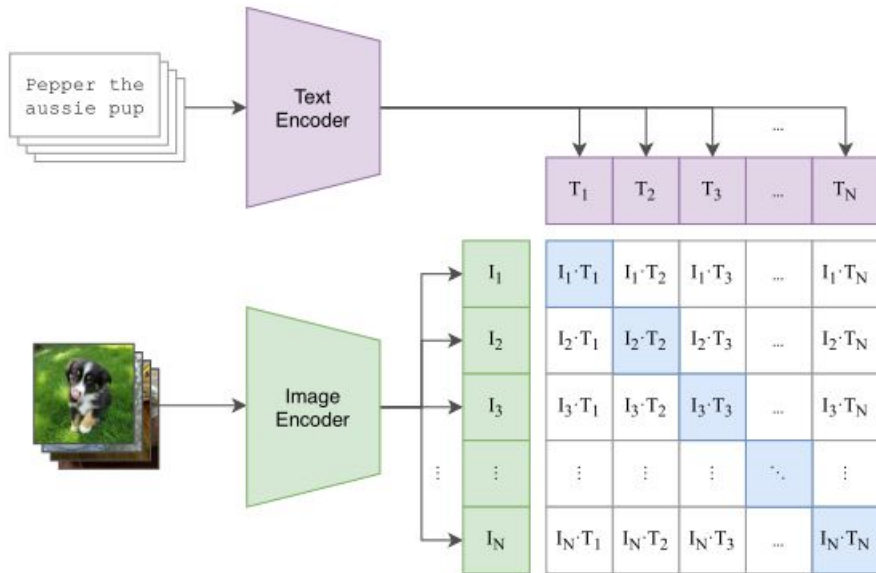
Barlow Twins



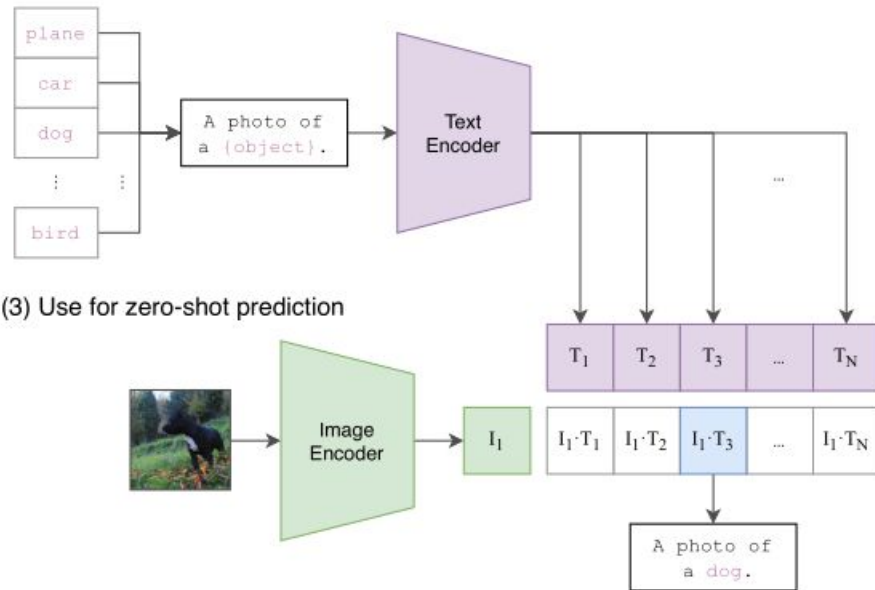
<https://doi.org/10.48550/arXiv.2103.03230>

CLIP: Contrastive Language-Image Pre-training

(1) Contrastive pre-training



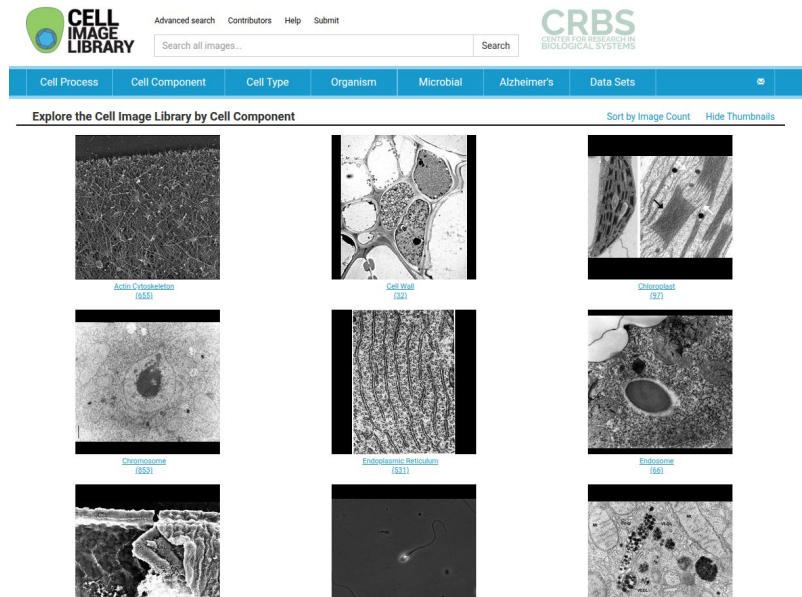
(2) Create dataset classifier from label text



<https://doi.org/10.48550/arXiv.2103.00020>

Дальнейшие шаги

- модификация Barlow Twins и дополнение функции потерь
- дообучение на специальных датасетах
- поиск преобразований, хорошо распознаваемых моделью



[Cell Image Library](#)
[Haxby fMRI Dataset](#)
[Kaggle Blood Cells Dataset](#)

References

- [A Simple Framework for Contrastive Learning of Visual Representations](#)
- [Barlow Twins: Self-Supervised Learning via Redundancy Reduction](#)
- [Learning Transferable Visual Models From Natural Language Supervision](#)
- [Retraction Note: Stimulus-triggered fate conversion of somatic cells into pluripotency](#)
- [Siamese Network Features for Image Matching](#)