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# *AnimeRun: 2D Animation Visual Correspondence from Open Source 3D Movies*

## *Datasheet*

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### Abstract

This document is the Datasheet for the submission to NeurIPS 2022 Track on Datasets and Benchmarks with ID 40. In this document, we list information of the proposed AnimeRun by answering questions in the standard dataset template.

## 1 Dataset Documentation and Intended Usage

### 1.1 Motivation

- *Q1: For what purpose was the dataset created? Was there a specific task in mind? Was there a specific gap that needed to be filled?*
- *A1: The dataset is created to facilitate the study on correspondence for 2D cartoons. It provides correspondence labels in pixel-wise (optical flow) and region-wise (segment matching) levels, which can be then extended to help creating real-world 2D cartoon content. Specifically, accurate animation optical flow can help fine-grained samplings on pixels of existing animation frames to synthesize new in-between ones, which implements automatic animation video interpolation [5]. While a region-level correspondence can help matching segments in consecutive frames. With such region-wise correspondence, given a colored frame as reference, one can apply automatic colorization on the rest black-and-white contour sequence by propagating the color in reference frame into matched segments in the next frame. The existing optical flow datasets are mostly made in natural scenes, with complex lighting and blurs. While the features of 2D cartoons are mainly on flat area and explicit contour lines. This leads to a domain gap between existing flow data and 2D animations. Especially, without explicit contour lines, natural scene data cannot be formulated into segment-wise correspondence as needed by 2D cartoon tasks. The only existing public cartoon correspondence dataset, CreativeFlow+ [4], is rendered within simple image compositions and relatively small motions, where one data sequence only has one model with limited movement, which is not practical for real cartoons. To fill that gap, we make AnimeRun, the first full-scene 2D animation correspondence dataset.*
- *Q2: Who created the dataset (e.g., which team, research group) and on behalf of which entity (e.g., company, institution, organization)?*
- *A2: This dataset is created by and belongs to S-lab, Nanyang Technological University.*

### 1.2 Composition

- *Q1: What do the instances that comprise the dataset represent (e.g., documents, photos, people, countries)? Are there multiple types of instances (e.g., movies, users, and ratings; people and interactions between them; nodes and edges)?*

- *A1: The datasets is mainly comprised of frame sequences stored in .png format, forward and backward optical flows stored in .flo format, cartoon segmentation labels stored in npy format and forward and backward segment matching stored in .json format.*
- *Q2: Does the dataset contain all possible instances or is it a sample (not necessarily random) of instances from a larger set? If the dataset is a sample, then what is the larger set? Is the sample representative of the larger set (e.g., geographic coverage)? If so, please describe how this representativeness was validated/verified. If it is not representative of the larger set, please describe why not (e.g., to cover a more diverse range of instances, because instances were withheld or unavailable).*
- *A2: We release the whole dataset.*
- *Q3: Are relationships between individual instances made explicitly (e.g., users' movie ratings, social network links)? If so, please describe how these relationships are made explicit.*
- *A3: Instances in our data are transferred from isolated film cuts of three open-source movies, which do not have overlap.*
- *Q4: Are there recommended data splits (e.g., training, development/validation, testing)? If so, please provide a description of these splits, explaining the rationale behind them.*
- *A4: We provide a split for these clips to training subset (1760 frames) and test set (1059 frames); the average motion magnitudes of the two subsets are both around 19 pixels. For fair evaluation, we do not split continuous motion of one film cut into different subset to prevent algorithms simply multiplexing motion patterns in previous frames.*
- *Q5: Are there any errors, sources of noise, or redundancies in the dataset? If so, please provide a description.*
- *A5: We have tried our best to ensure the quality and correctness of the dataset. For every image, we performed warp checking to ensure the correctness of optical flow, both quantitatively and manually.*
- *Q6: Is the dataset self-contained, or does it link to or otherwise rely on external resources (e.g., websites, tweets, other datasets)? If it links to or relies on external resources, a) are there guarantees that they will exist, and remain constant, over time; b) are there official archival versions of the complete dataset (i.e., including the external resources as they existed at the time the dataset was created); c) are there any restrictions] (e.g., licenses, fees) associated with any of the external resources that might apply to a future user? Please provide descriptions of all external resources and any restrictions associated with them, as well as links or other access points, as appropriate.*
- *A6: AnimeRun is self-contained.*
- *Q7: Does the dataset contain data that might be considered confidential (e.g., data that is protected by legal privilege or by doctor/patient confidentiality, data that includes the content of individuals' non-public communications)? If so, please provide a description.*
- *A6: No. All source films to make AnimeRun are public available.*
- *Q8: Does the dataset contain data that, if viewed directly, might be offensive, insulting, threatening, or might otherwise cause anxiety? If so, please describe why.*
- *A8: No. All source contents are public and age-free. When making this dataset, we further scanned and removed all controversial content. The screening is to avoid the content that may be (1) racist/discriminatory/prejudicial or (2) extreme violent/terrifying. Content screening is conducted frame by frame by the authors. If one author disputes the content, we would have a discussion and decide whether to remove it. Specifically, we deleted all shots of a controversial character, Wu Manchu, which is concerned to be within racism. We also excluded all potentially fear-inducing animation scenes like snails crawling into mouth and ears. Therefore, our dataset does not contain any offensive, insulting, threatening scenes.*
- *Q9: Does the dataset relate to people? If not, you may skip the remaining questions in this section.*
- *A9: No.*

### 1.3 Usage

- Q1: *Has the dataset been used for any tasks already? If so, please provide a description?*
- A1: *This dataset is used for optical flow and segment correspondence tasks on 2D cartoons. In our paper, we describe the usefulness of our data in real-world applications on 2D animations.*
- Q2: *Is there a repository that links to any or all papers or systems that use the dataset? If so, please provide a link or other access point.*
- A2: *We provide our dataset and code in <https://lisiyao21.github.io/projects/AnimeRun>*
- Q3: *What (other) tasks could the dataset be used for?*
- A3: *This dataset can be used for tasks related to cartoon creation.*
- Q4: *Is there anything about the composition of the dataset or the way it was collected and preprocessed/cleaned/labeled that might impact future uses? For example, is there anything that a future user might need to know to avoid uses that could result in unfair treatment of individuals or groups (e.g., stereotyping, quality of service issues) or other undesirable harms (e.g., financial harms, legal risks) If so, please provide a description. Is there anything a future user could do to mitigate these undesirable harms?*
- A4: *No.*
- Q5: *Are there tasks for which the dataset should not be used? If so, please provide a description.*
- A4: *N/A.*

### 1.4 Distribution

- Q1: *Will the dataset be distributed to third parties outside of the entity (e.g., company, institution, organization) on behalf of which the dataset was created? If so, please provide a description.*
- A1: *No.*
- Q2: *How will the dataset will be distributed (e.g., tarball on website, API, GitHub)? Does the dataset have a digital object identifier (DOI)?*
- A2: *It is distributed on our GitHub website <https://lisiyao21.github.io/projects/AnimeRun>.*
- Q3: *When will the dataset be distributed?*
- A3: *It has been released at <https://lisiyao21.github.io/projects/AnimeRun>.*
- Q4: *Will the dataset be distributed under a copyright or other intellectual property (IP) license, and/or under applicable terms of use (ToU)? If so, please describe this license and/or ToU, and provide a link or other access point to, or otherwise reproduce, any relevant licensing terms or ToU, as well as any fees associated with these restrictions.*
- A4: *It is expected to be distributed under CC BY-NC License. It has been released at <https://lisiyao21.github.io/projects/AnimeRun>.*
- Q5: *Have any third parties imposed IP-based or other restrictions on the data associated with the instances? If so, please describe these restrictions, and provide a link or other access point to, or otherwise reproduce, any relevant licensing terms, as well as any fees associated with these restrictions.*
- Q6: *Do any export controls or other regulatory restrictions apply to the dataset or to individual instances? If so, please describe these restrictions, and provide a link or other access point to, or otherwise reproduce, any supporting documentation.*
- A5: *No.*

### 1.5 Accessibility

- *Link to access the dataset: <https://lisiyao21.github.io/projects/AnimeRun>.*
- *Source films are licensed as CC-BY. Links to access the metadata are [1, 2, 3]*

- *Siyao is currently maintaining the web page on Github and the dataset on Google drive. We are also exploring new solutions to store this dataset more stably.*
- *The dataset is released under CC BY-NC 4.0 License.*

## References

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- [4] Maria Shugrina, Ziheng Liang, Amlan Kar, Jiaman Li, Angad Singh, Karan Singh, and Sanja Fidler. Creative flow+ dataset. In *CVPR*, 2019. 1
- [5] Li Siyao, Shiyu Zhao, Weijiang Yu, Wenxiu Sun, Dimitris Metaxas, Chen Change Loy, and Ziwei Liu. Deep animation video interpolation in the wild. In *CVPR*, 2021. 1