





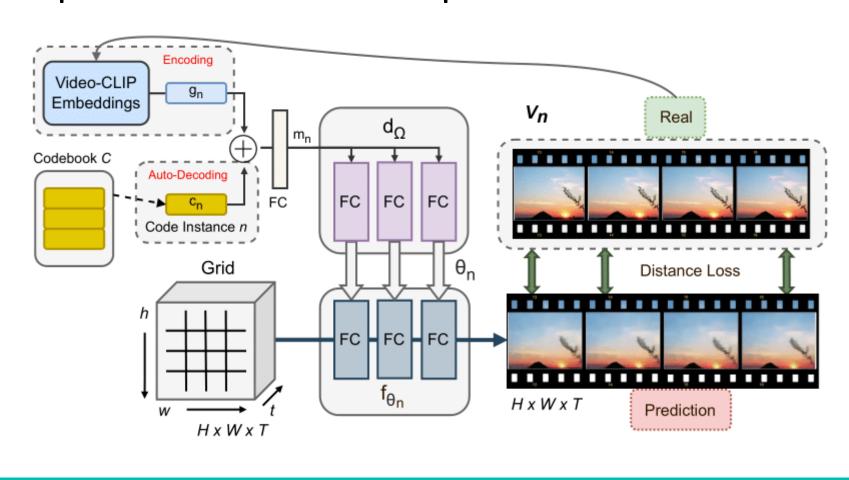
# INR-V: A Continuous Representation Space for Video-based Generative Tasks (TMLR 2022)

#### **ABSTRACT**

Generating videos is a complex task that is accomplished by generating a set of temporally coherent images frame-by-frame. This limits the expressivity of videos to only image-based operations on the individual video frames needing network designs to obtain temporally coherent trajectories in the underlying image We propose INR-V, video space. representation network that learns a continuous space for video-based generative tasks. The representation space learned by INR-V is more expressive than an image space showcasing many interesting properties.

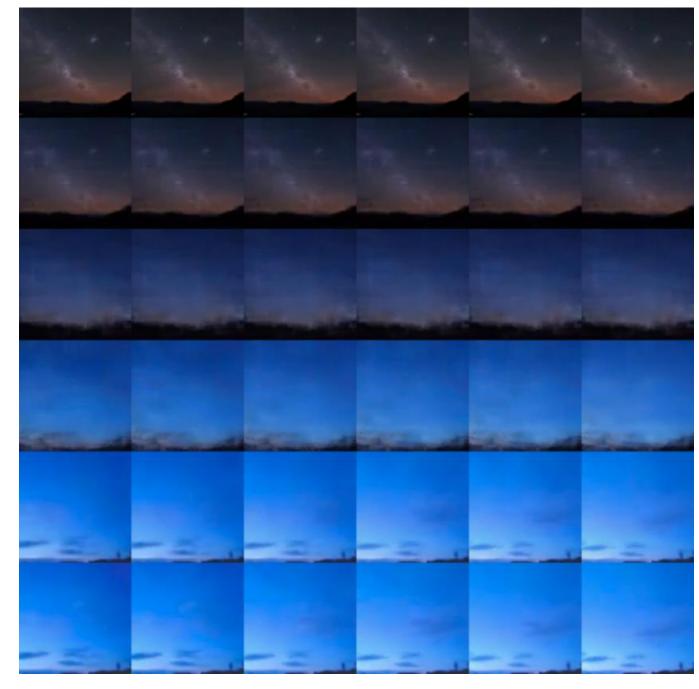
#### **METHODOLOGY**

INR-V parameterizes videos using implicit neural representations, a MLP that predicts an RGB value for each input pixel location of the video. The INR is predicted using a hypernetwork trained on neural representations of multiple videos.



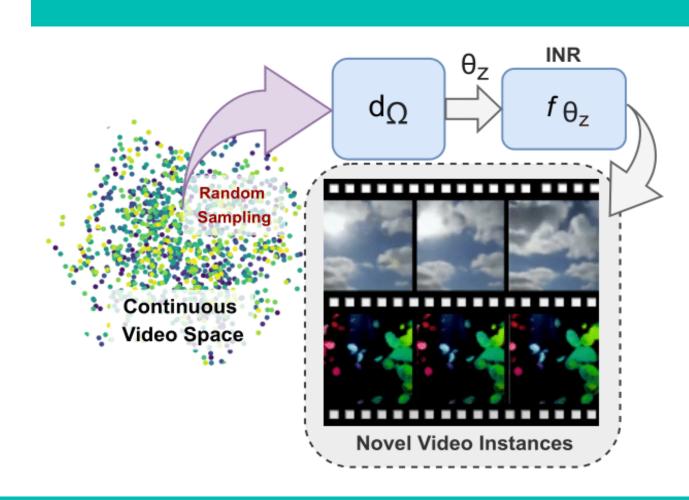
#### **RESULTS**





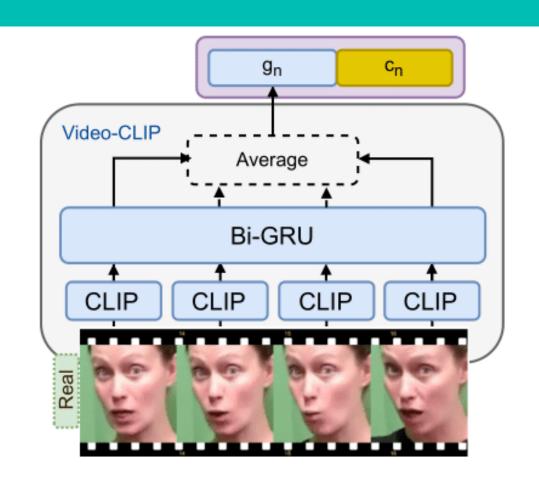
#### Hypernetwork on INRs

Each point in the hypernetwork's space encodes an implicit function of a meaningful video. A single video is represented as an implicit neural representation.



#### Regularization

We design Video-CLIP that encodes an entire video to a meaningful latent representation that is used to regularize the space of the implicit functions.



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### CONCLUSION FUTURE

INR-V is continuous video representation network using implicit neural representations to parameterize videos as complete signals. INR-V opens the door to a multitude of video-based tasks and removes the dependency on an We generator. image propose downstream tasks several observe that INR-V outperforms the existing works on a majority of these tasks.

#### **REFERENCES**

**WORKS** 

- Vincent Sitzmann, Implicit neural representations with periodic activation functions, '20
- Ivan Skorokhodov, Stylegan-v: A continuous video generator with the price, image quality and perks of stylegan2, '21
- Sihyun Yu, Generating videos with dynamics-aware implicit GANs, '22