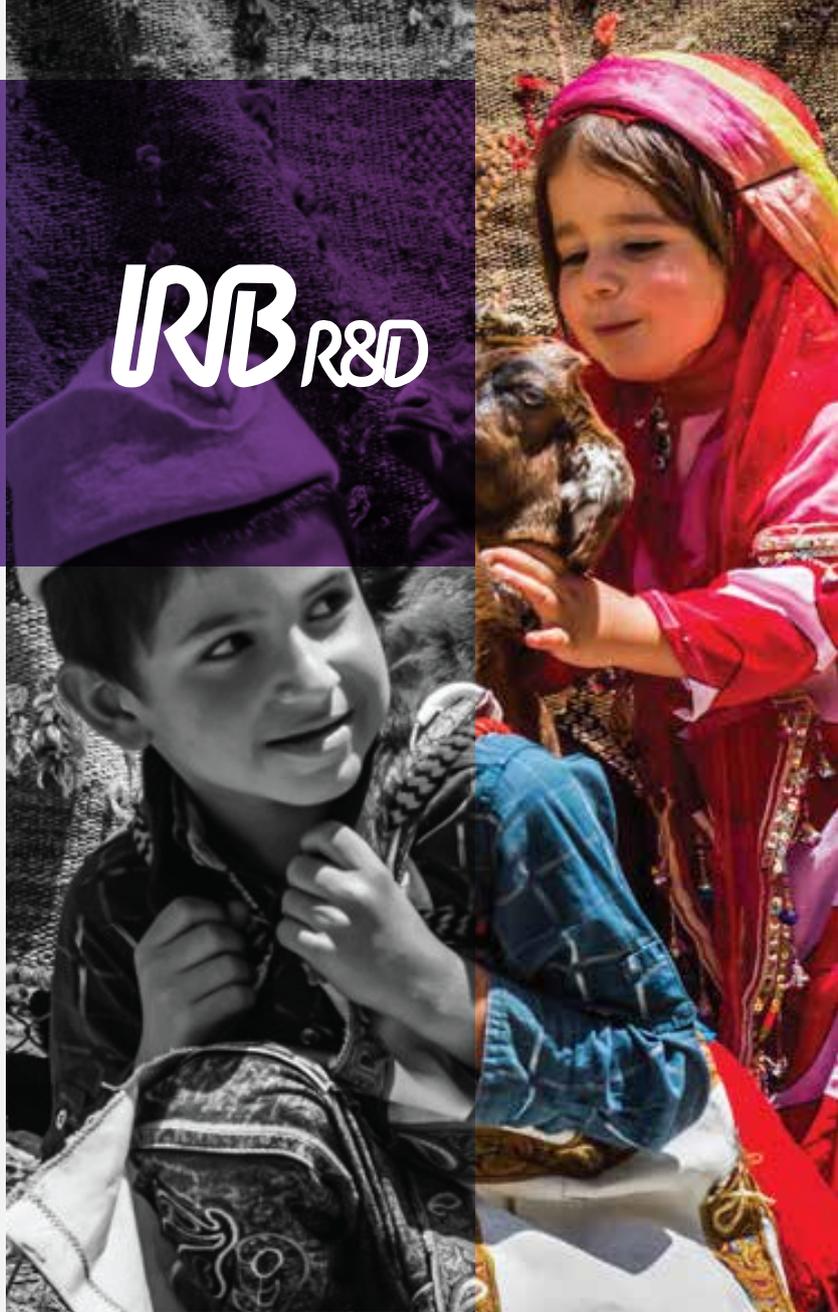


# Video Colorization

IRB R&D

## Colorization History

Painting grayscale images and movies is a very old idea dating back to 1902. At first, the painting was done manually. But today, fully automated solutions have been developed. Many automatic methods use traditional computer vision techniques. But with the deep learning revolution, image colorization techniques have also made great strides toward improvement and have made significant progress. On the other hand, in 2014, Generative Adversarial Networks (GANs) were introduced, using two deep neural networks. In fact, the two networks play the role of two players, one of which is a discriminator and the other a generator one, acting as a detective and forger. As the generator tries to produce real colorized samples from the grayscale images, the discriminator tries to distinguish the real samples from the samples produced by the generator.



The competition between these two networks forms the training. GAN networks have been widely used in color rendering or other editing of images and have shown the highest performance.





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✉ [rd@irib.ir](mailto:rd@irib.ir)

🌐 [www.rd.irib.ir/en](http://www.rd.irib.ir/en)

☎ +98-21-22164060

📞 +98-21-22164181

🌐 [www.linkedin.com/company/iribrd](https://www.linkedin.com/company/iribrd)

📍 IRIB R&D Center, IRIB, Valiasr Ave.,  
Tehran, Iran,  
P.O: 193953895

More Info



Website: [rd.irib.ir/en](http://rd.irib.ir/en)

## Features:

- Uses wide range of colors
- Understands simple concepts
- Robust colorization
- Minimum color jump between video frames

The current software, with a GAN network in its backbone, colorized images and videos in a colorful and robust manner. Using wide range of coloring, alongside with a level of concept understanding, make the solution unique. In other words, the network always paints a grass as green not blue, but based on the gray level of complex feature of the picture it uses different kinds of greens. In video, the network tries to minimize the distortion and differences between two frames. Thus, there is not much color jump in the output video.

