**INTRODUCTION**

Film-Colorization or Colorization is any process that adds color to black-and-white, sepia, or other monochrome moving-picture images. The first examples date from the early 20th century, but colorization has become common with the advent of digital image processing. The first film colorization methods w­­ere hand done by individuals. The process was always done by hand, sometimes using a stencil cut from a second print of the film, such as the 'Pathécolor' process. These colorization methods were employed until effective color film processes were developed. During the late 1960s and the early 1970s, black-and-white cartoons were redistributed in color.

But as you can imagine this process was extremely tedious consuming hundreds of man hours to colorize only a few minutes of film.

This field was completely revolutionized with rise of computers in 1970s. With techniques developed by researches like Wilson Markle, attempts were made at colorization. These early attempts where accompanied with issues like soft contrast, pale, flat and washed out colors. However the technology has been steadily improving ever since the 1980s. To perform digital colorization, an artist can colorize a black-and-white film frame-by-frame. Although this time consuming, the software allow the artist to maintain a certain amount of consistency in color across the frames.

To automate this, a system needs to be developed that can take an image or a video as an input and colorize it. This can be accomplished with the help of a tools like Machine Learning. A model can be trained to map monochrome colors to a set of RGB values that can generate a colorized image. The program can later be modified to accept video files to be colorized using the same technique. The application of such a software can save a lot of work, energy and money as big movie studios spend crores of rupees on colorizing a single film. (For example, It costed 1.05 crores to partially color Mughal-e-Aazam, a classic Bollywood movie which was originally filmed on black-and-white film).

**PROBLEM STATEMENT**

To create an system which could process a black-and-white, sepia or any other monochromatic image and colorizing into an RGB image, by training a model that can map shades of a monochromatic image color spectrum, hence generating colorized image using some reference image provided by the end user. The reference image provided by the user will enable the model to generate a color spectrum and colorize the image accordingly.

**OBJECTIVES**

* Use machine learning to improve mapping of colors
* Successfully Colorize an Image
* Apply the Colorization Technique to Colorize a Video
* Use certain algorithms to reduce irregularities in color between frames.

**SCOPE**

The main goal of our project is to create an application that can enable anyone to colorize an old photo or film that had been shot with a camera when only monochrome films were available. This technology can give us the power to look back at the images from the past era and help us understand and reconnect with those moments more easily. This program will be capable enough to recognize patterns for some images and colorize them on their own along with allowing the artist to decide what color should be used to colorize which parts of the frame. This has the capacity to save millions of dollars and bring the tools that professions use to work on million dollar motion pictures to any user who wishes to use it.