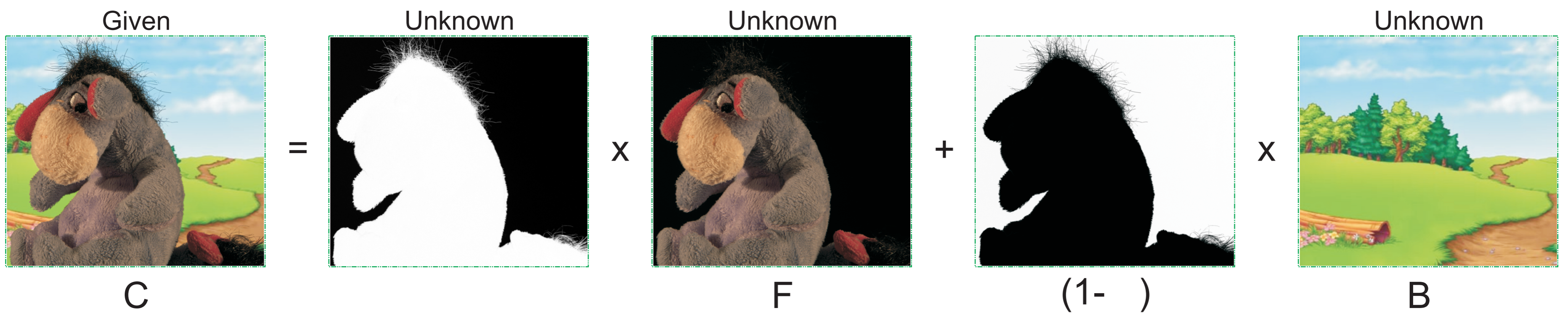


Image Matting

The compositing equation formalizes the creation of a composite image C by linearly combining a foreground image F and a background image B according to a matte that defines the opacity for each foreground pixel.



Matting is the inverse process of compositing that attempts to determine the foreground image F , background image B and matte given a composite image C (see images above).

Research Topics

Ground Truth (GT) Data

The Goal:

To provide a test bed for the quantitative evaluation of single image matting algorithms.

The Strategy:

A complete solution to the matting problem can be obtained by photographing the foreground object against two or more different backgrounds. This method is also known as Triangulation Matting.

Research Status:

- During a first test run we already acquired GT data of a quality higher than the current state-of-the-art. To achieve such a high quality, we had to capture dozens of registered images for a single scene.
- However, we could not manage to completely avoid camera shake, caused by the mechanics of the camera and from the environment, over so many exposures.
- We are confident of eliminating the camera shake, by using advanced camera hardware or by aligning the images with software algorithms, to be able to capture the final GT data very soon.

Texture-Based Matting

Observations:

The reconstructed foreground and background images are inaccurate by most state-of-the-art methods. Errors in the reconstructed foreground and background images corrupt mattes. This can lead to unpleasant artifacts in the new composite image.



The Goal:

To improve the reconstruction of the foreground and background images.

The Strategy:

To constrain the reconstructed foreground and background to have the same image characteristics as parts of the image which are definitely known to belong to the foreground and background, respectively.

Research Status:

We outlined our new algorithm and implemented parts of it. We will present first results in the near future.

[1] Levin A., D. Lischinski and Y. Weiss. A Closed Form Solution to Natural Image Matting. IEEE Trans. Pattern Analysis and Machine Intelligence, accepted for publication.