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The blurred smear of an object is caused by the motion during the exposure time. We want to analyze the smear’s alpha matte (its transparency) by

* An algorithm
* Shooting in controlled conditions

Given some properties we can retrieve:

* Contour at the beginning and end of the exposure
* Contour at arbitrary time instants
* Envelopes of the moving contour
* Path of the corners of the contour
* Speed discontinuities

Some of this information can be recovered on the original image without alpha matting

**3.2 Recovery of the Alpha Matte**

Our problem is under-constrained, even if the background is known. There are different approaches:

* Specific background (blue or green), (Mishima 1993; Smith and Blinn 1999)
* Unknown backgrounds with minimal assistance, (Apostoloff and Fitzgibbon 2004; Berman et al. 2000; Chuang et al. 2001; Levin et al. 2006; Ruzon and Tomasi 2000; Sun et al. 2004)

None of them are designed for interpreting blurred smears so when large enough areas with alpha = 1 are visible we can get satisfactory results, when long blurred smears they rarely work. They propose alternatives:

* Constant intensity object on a known background, on each pixel solving a first-degree linear equation
* Color image can be computed on the same way over all the channels separately

“Moreover, as we discuss in Sect. 5.2, some of our results

also hold for the original image; this is extremely useful in

practice, because it provides a way to apply our theory even

in situations where alpha matting is infeasible, unreliable or

too computationally intensive.”