What is TIP?

Input: a single picture
What is TIP?

Output: a 3D-like animation
Why TIP?

- Reconstruct detailed 3D model from the picture?
  - Very difficult, even by manually calibration.
  - One picture is not sufficiently informative.
- TIP supplies a much simplified 3D model (Box).
Process Flow

Figure 1. Process flow diagram
Process Flow

• (a) Get the input image
• (b) Define the background and extract the foreground mask.
• (c) Inpaint the background to make it complete.
  ○ We can use several image inpainting techniques today.
(d) Build the spidery mesh by user input.
(e) Modeling the 3D background.
In the original paper, the authors didn’t really even reconstruct the 3D box model.
The Method in the Original Paper

- Interactive controlling of spidery mesh.

(a) Deformation of the inner rectangle  (b) Translation of the inner rectangle
The Method in the Original Paper

• Generate the new background

(a) Specified spidery mesh
(b) Deduced 2D polygon
(c) Estimating the vertices of the 3D rectangles
Current Method

- If we know the vanishing point and the assumed 3D structure, we can estimate the camera.
- Refer to §8.9 Single view reconstruction, *Multiple View Geometry in Computer Vision*.

Fig. 8.26. **Single view reconstruction.** (a) Original image of the Fellows quad, Merton College, Oxford. (b) (c) Views of the 3D model created from the single image. The vanishing line of the roof planes is computed from the repetition of the texture pattern.
Process Flow

- Attach foreground object to the model
Process Flow

- Final Result

(f) Foreground model  (g) Camera positioning  (h) Rendered image