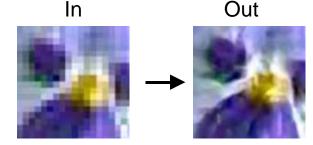
MIT2001-07: Example-Based Image Synthesis



William T. Freeman



- Using a large training database, apply an example-based approach to problems of image and shape synthesis.
- Potential applications:
 - <u>Video image super-resolution</u>: estimating missing high-resolution details, given a low-resolution video input.



- <u>Computer vision shape reconstruction</u>: estimating a high-resolution shape, given a high-resolution image and a low-resolution initial shape estimate.
- <u>Animation synthesis</u>: control the displayed images of one person (A) using a camera monitoring a second person (B). B makes A move the way B did.





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Progress Through December 2001

(Joined NTT-MIT collaboration on November 1, 2001)

- Trained student about existing super-resolution algorithms and software. Made initial studies on extending still-image work to video sequences.
- Met with Dr. Ogura, Head of Human Communication Laboratory. Learned of mutual interest in shape reconstruction.
- Found MIT student to work on example-based shape reconstruction problem.

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Research Plan for the Next Six Months

- Video image super-resolution (student: Russell)
 - Include temporal consistency constraints
 - Integrate motion estimation algorithm
 - Generalize image patch data to spatio-temporal patches.
- Example-based shape reconstruction (student: Gilja)
 - Experimentation with synthetic images and shapes.
 - Application to computer vision stereo reconstruction algorithm output.
- Animation synthesis:
 - Find appropriate MIT student
 - Learn probabilistic model of output character from training examples.