

* Overview

Texture Synthesis (Quilting)

-- Siggraph 2000

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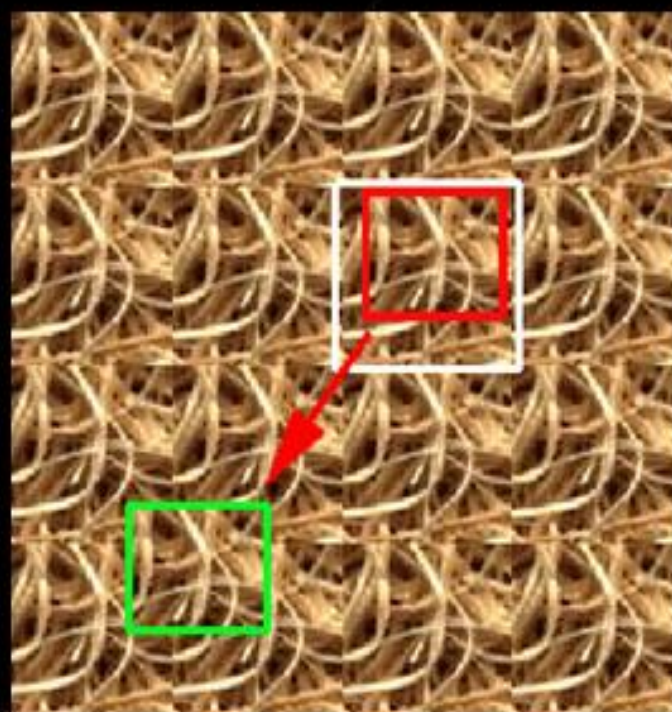
Objectives



Chaos Mosaic [Xu, Guo & Shum, '00]



input



idea



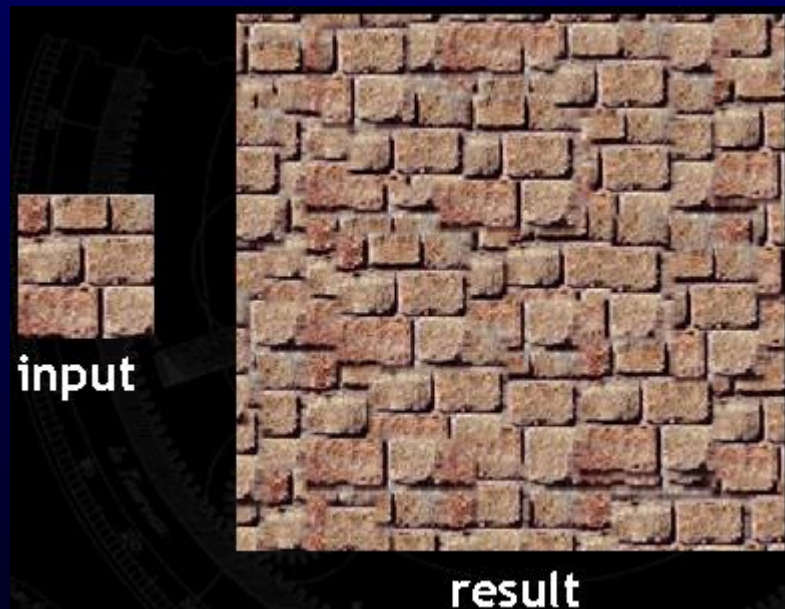
result

Process: 1) tile input image; 2) pick random blocks and place them in random locations
3) Smooth edges

Used in Lapped Textures [Praun et.al, '00]

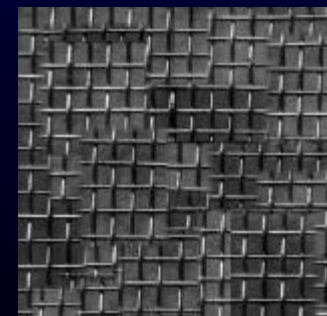
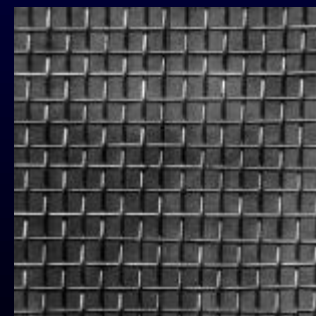
Xu's method

- Ⓜ Motivated by Photoshop
- Ⓜ Fails on structured textures

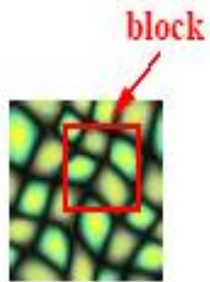


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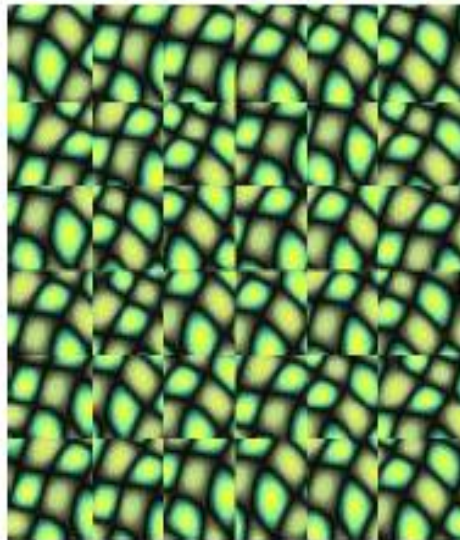
Quilting



input
texture



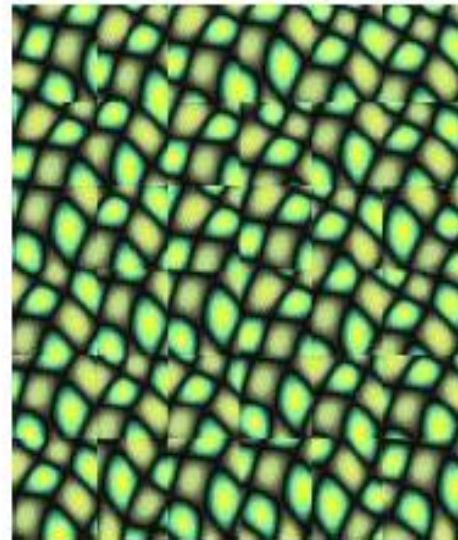
random placement
of blocks



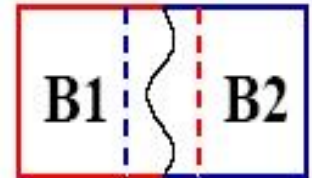
(a)



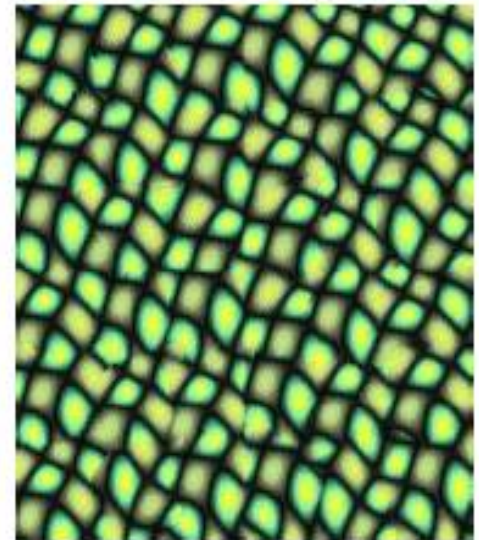
neighboring blocks
constrained by overlap



(b)



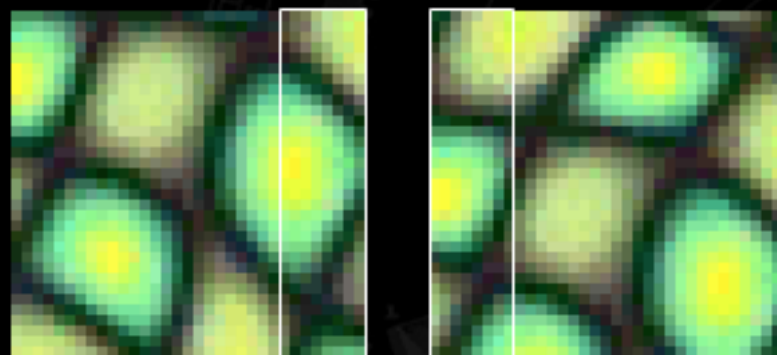
minimum error
boundary cut



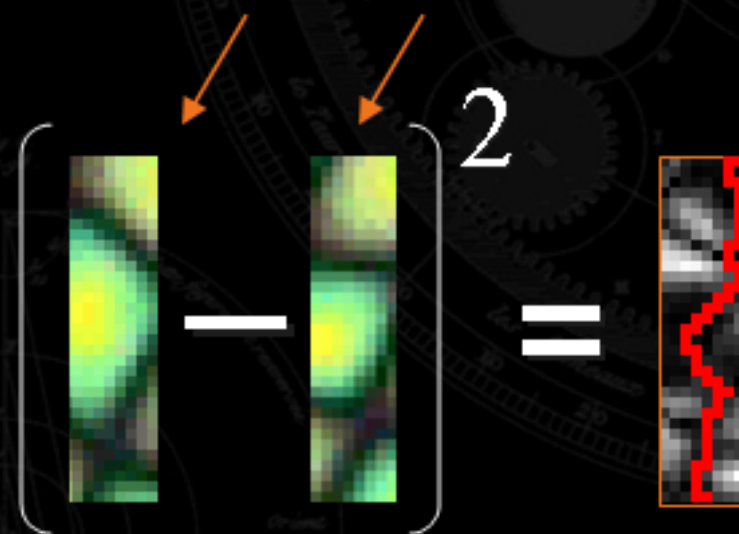
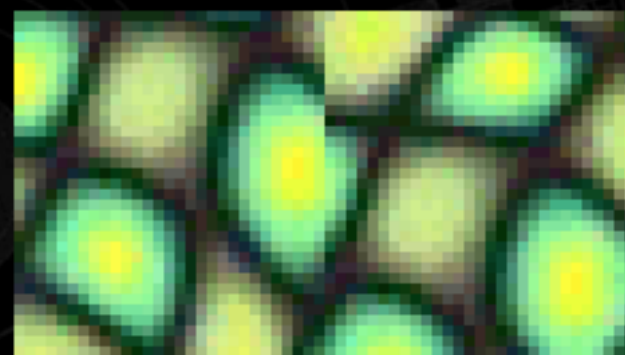
(c)

Minimal error boundary

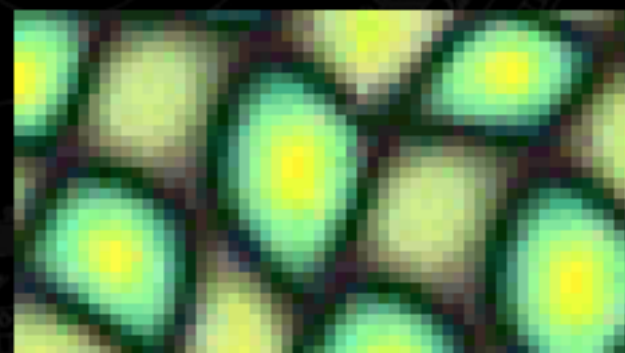
overlapping blocks



vertical boundary



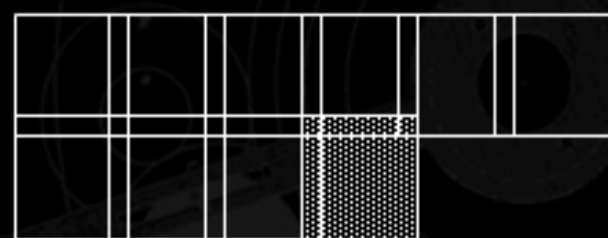
overlap error



min. error boundary

Algorithm

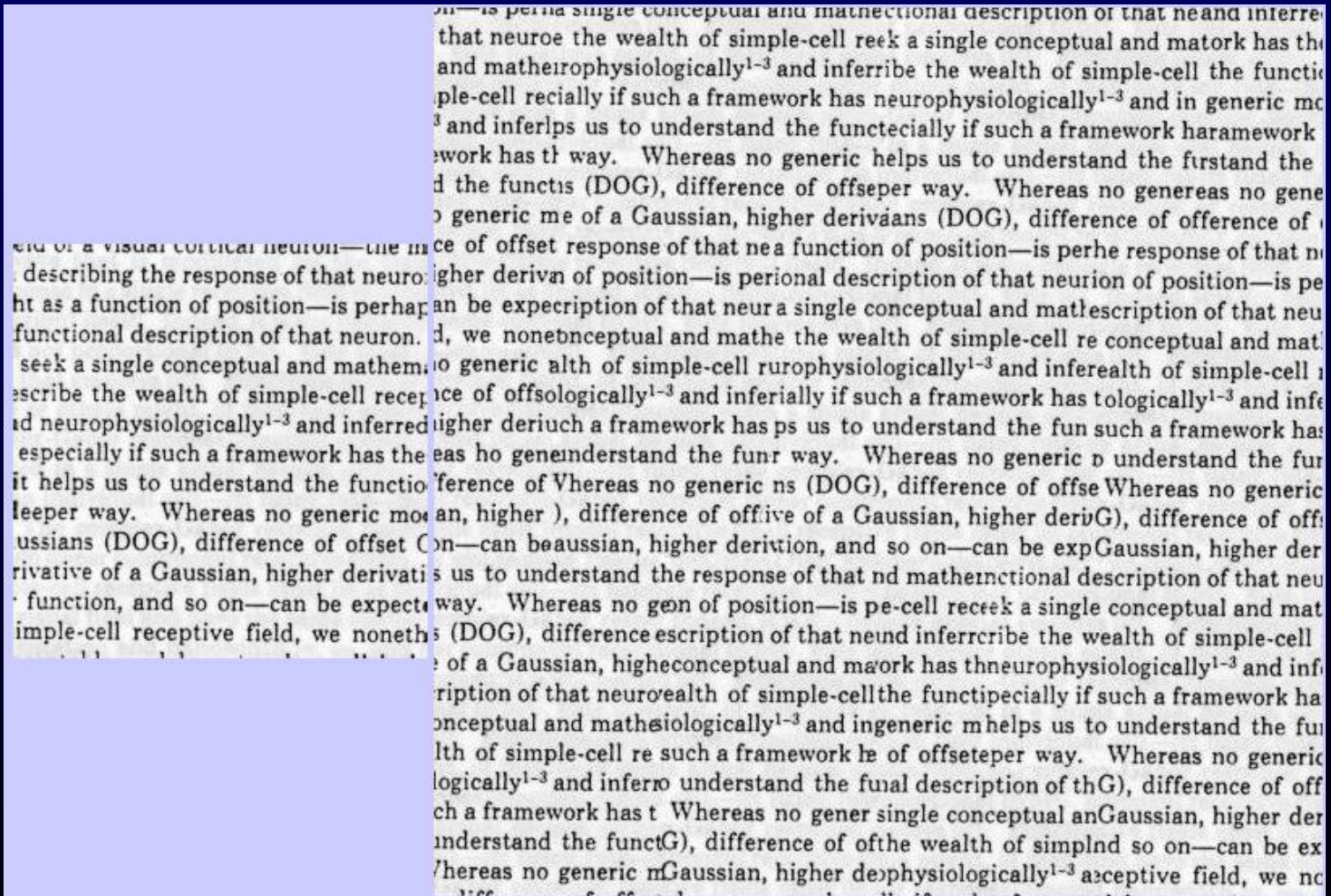
- Pick size of block and size of overlap
- Synthesize blocks in raster order



- Search input texture for block that satisfies overlap constraints (above and left)
 - Easy to optimize using NN search [Liang et.al., '01]
- Paste new block into resulting texture
 - use dynamic programming to compute minimal error boundary cut

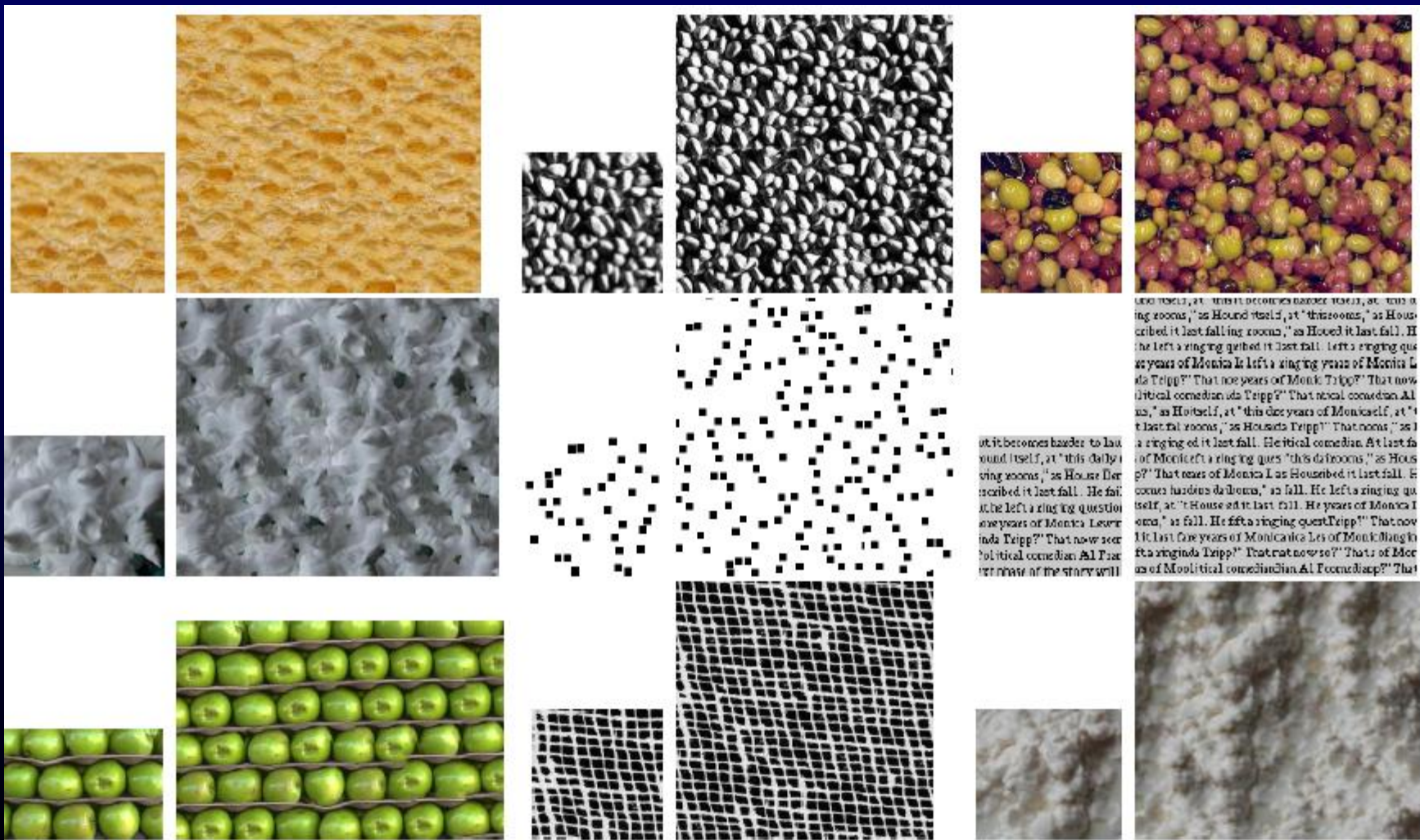
Quilting

② performs well on structured texture



Quilting

ⓐ performs well on both structured & unstructured textures



Texture Transfer



 next

* Overview

Fast Separation of Direct and Global Images

-- Siggraph 2006

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Task

Scene



Direct



Global

Usage

Eggs on a plate

Method : Checkerboard



Scene



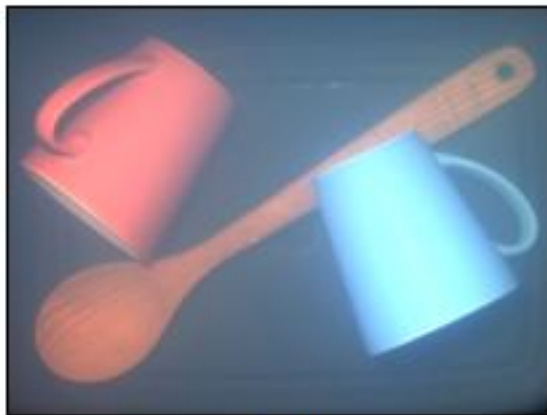
Direct



Global

Kitchen Sink : Objects in Milky Water

Method : Mesh Occluder



Scene

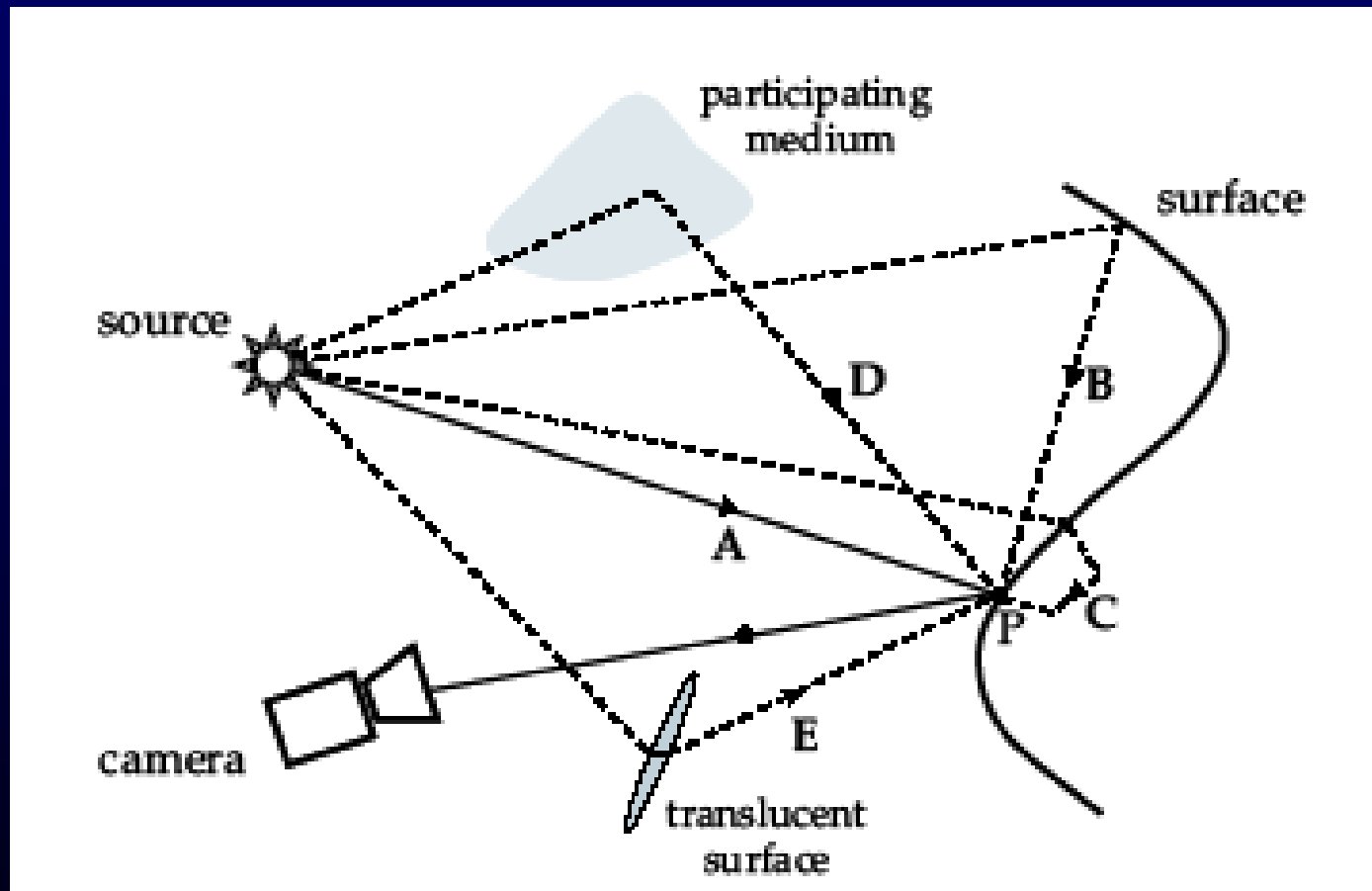


Direct



Global

Principle





Demo

 [Separation.mov](#)