Poisson Blending

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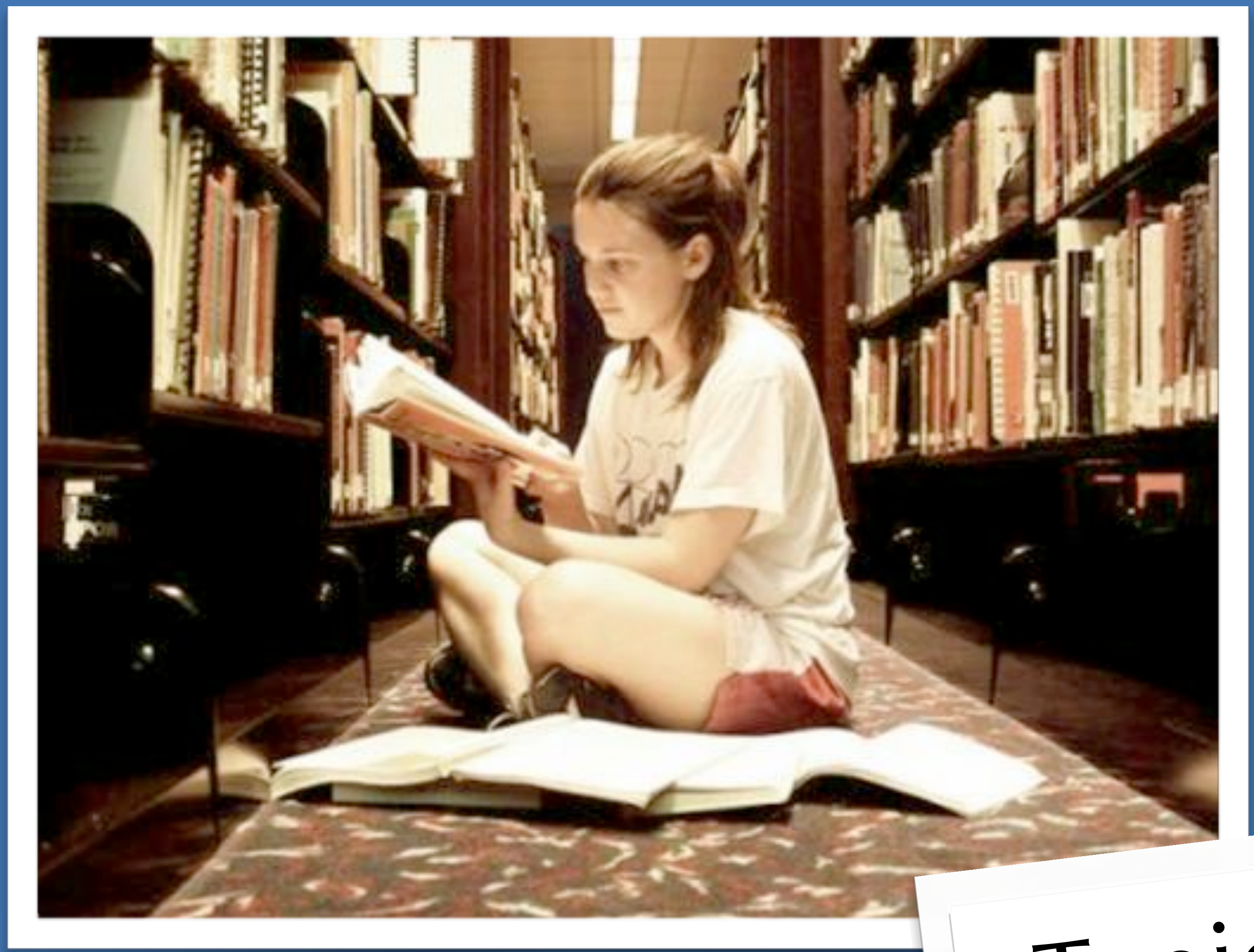
P2...

Will be released tomorrow...

GPU Tricks

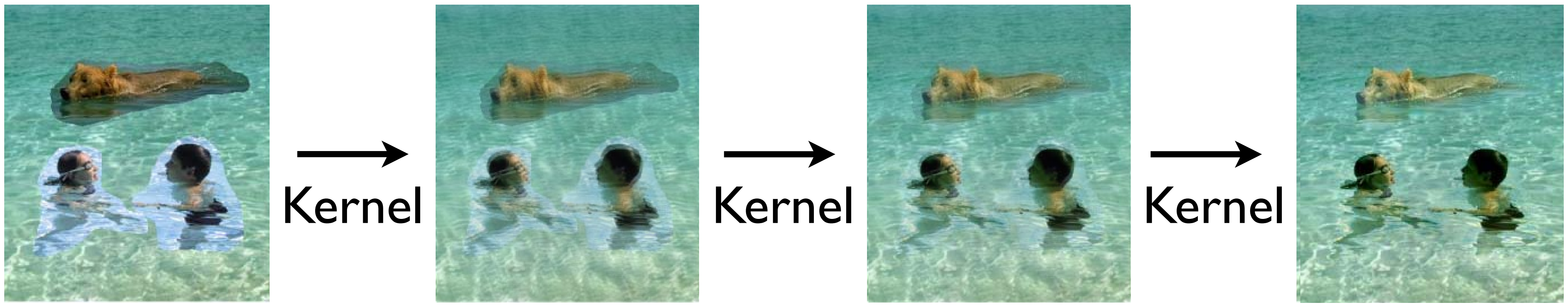


Topics?

Intelligent Blending

Demo:

Example:

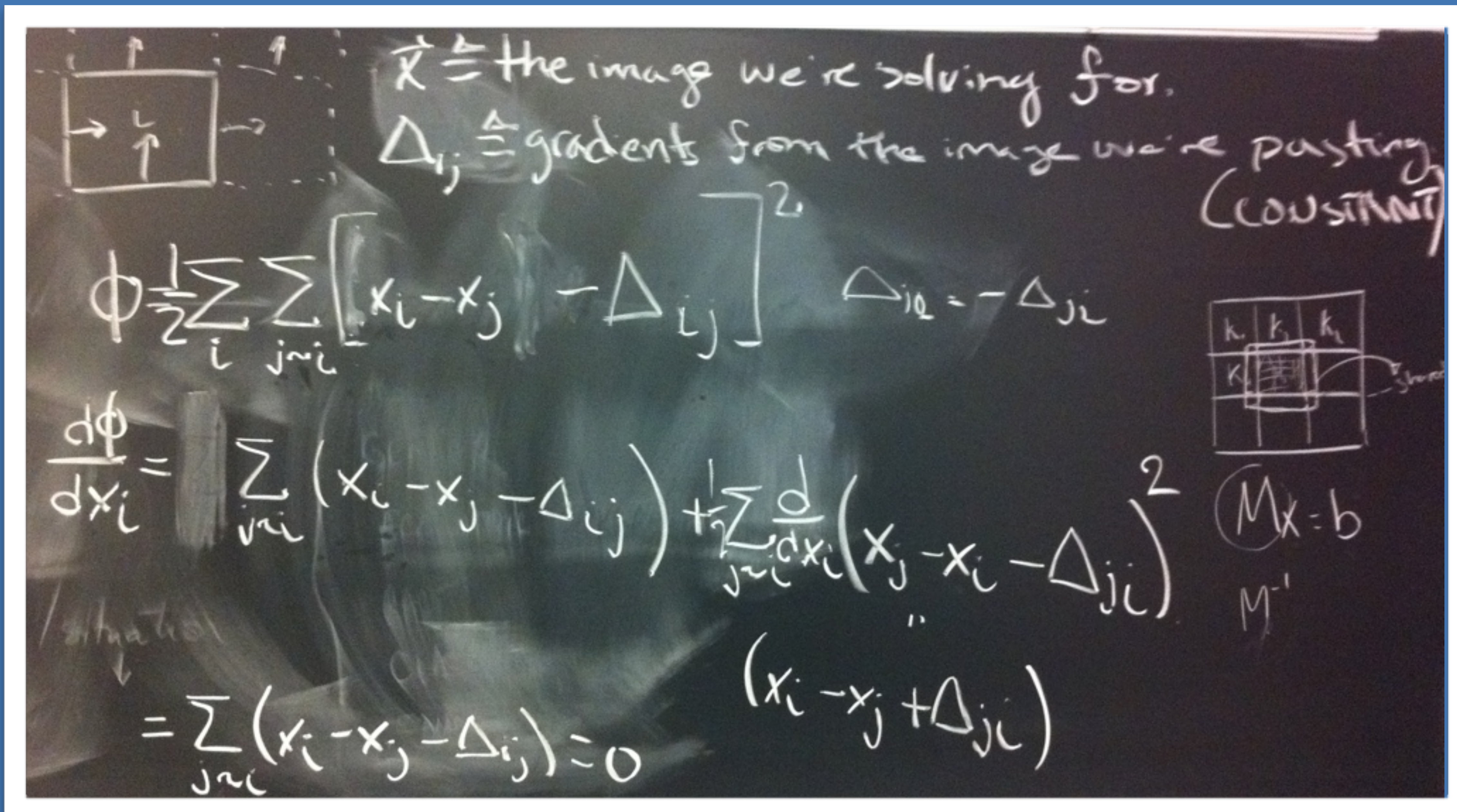


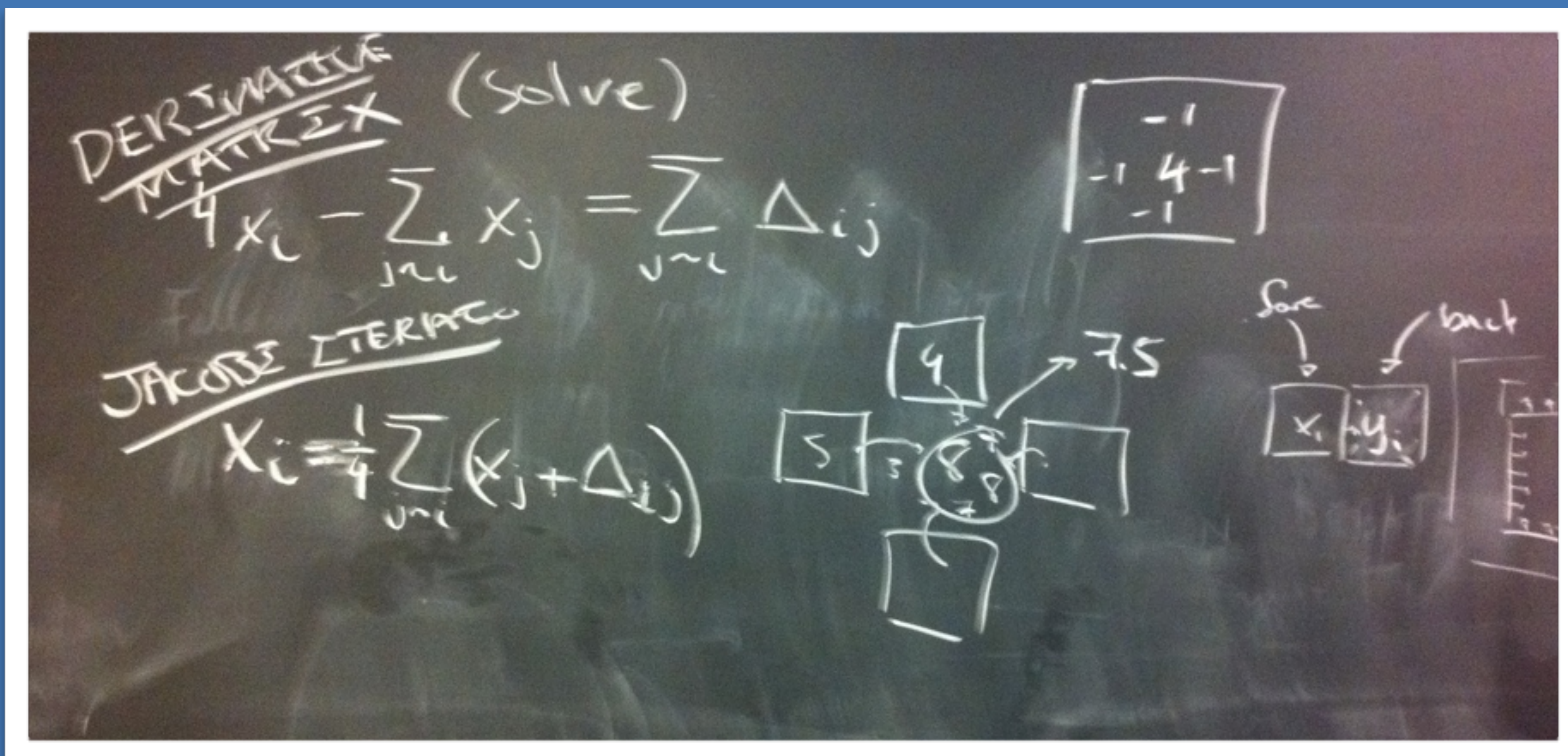
How Can We Do This?

- Think of *any* sort of algorithm which could do this!
- If we expressed this as an *objective function*, what would it be?
- What is the minimum of this function?
- How could we compute this efficiently?


How can we store this?

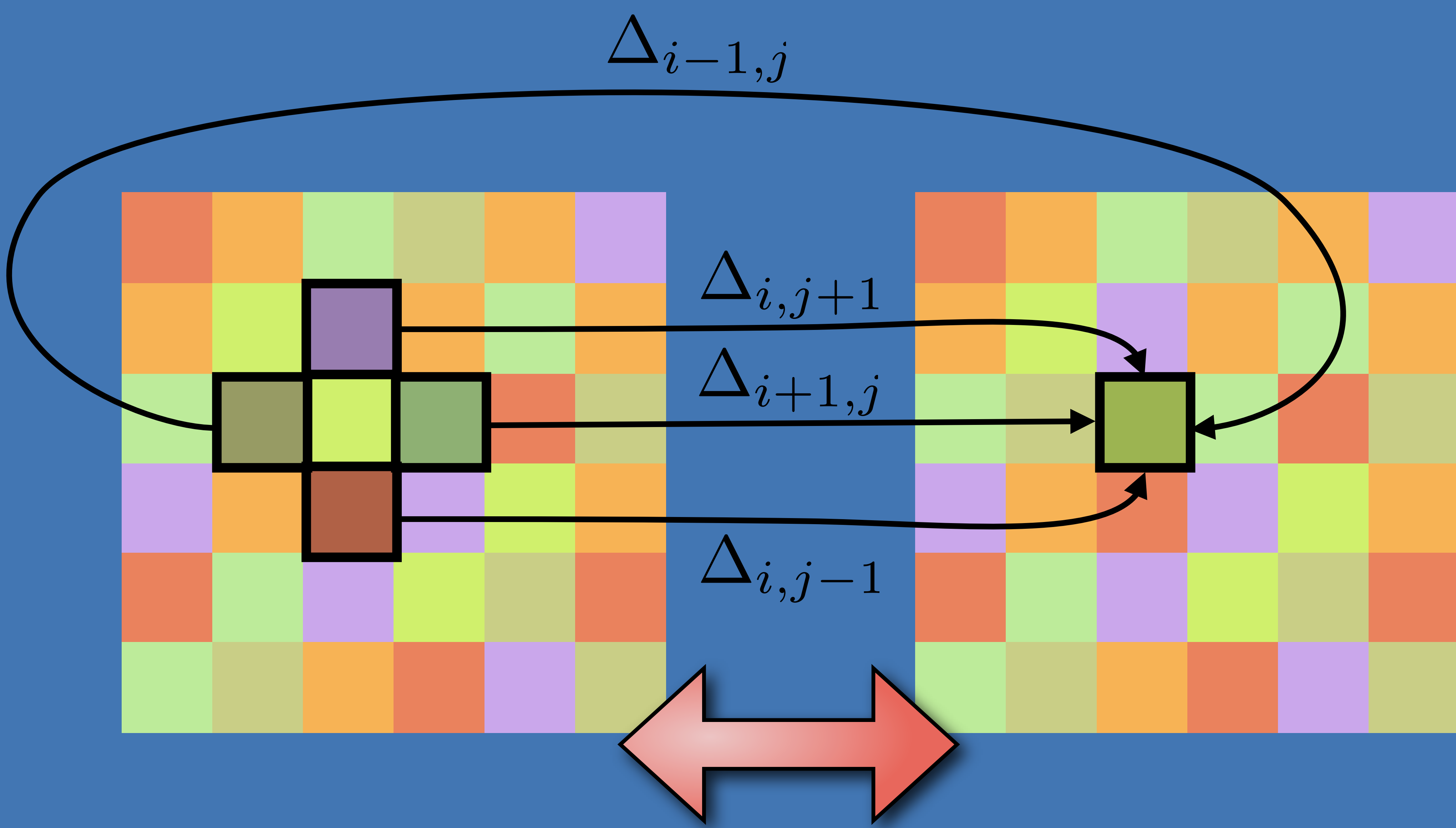
Poisson Blending


$\vec{x} \triangleq$ the image we're solving for.
$\Delta_{ij} \triangleq$ gradients from the image we're pasting
(CONSTANT)
$\phi = \frac{1}{2}\sum_i \sum_{j\sim i}\left[x_i - x_j - \Delta_{ij}\right]^2$
$\Delta_{ij} = -\Delta_{ji}$
$\frac{d\phi}{dx_i} = \sum_{j\sim i}(x_i - x_j - \Delta_{ij}) + \frac{1}{2}\sum_{j\sim i}\frac{d}{dx_i}(x_j - x_i - \Delta_{ji})^2$
$(x_i - x_j + \Delta_{ji})$
$= \sum_{j\sim i}(x_i - x_j - \Delta_{ij}) = 0$
$Mx = b$
M^{-1}


DERIVATIVE MATRIX
(solve)
JACOBI ITERATION
7.5
fore
back

Poisson Blending

(Jacobi Iterations)



GPU Caching

Board...

Conjugate Gradient

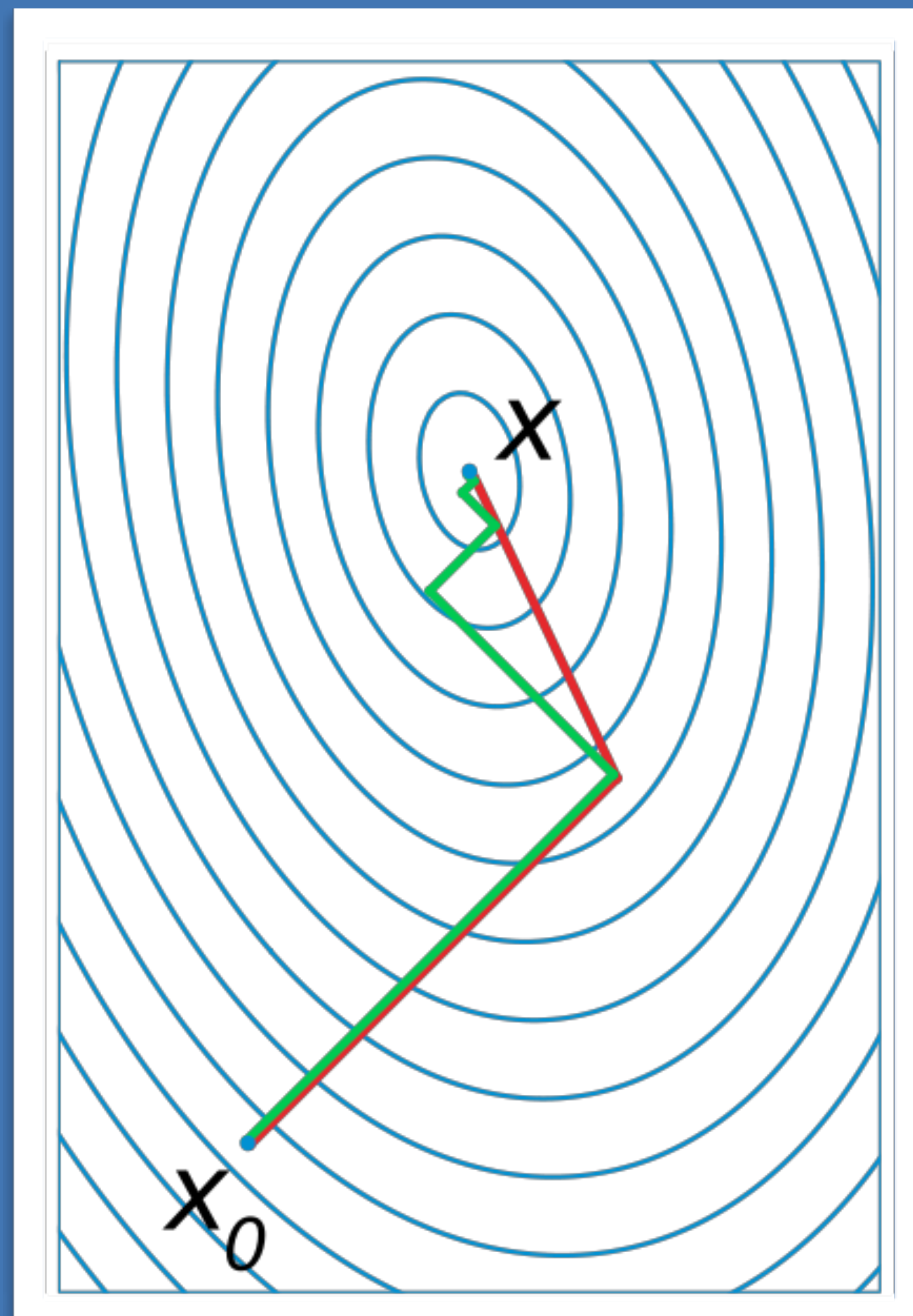
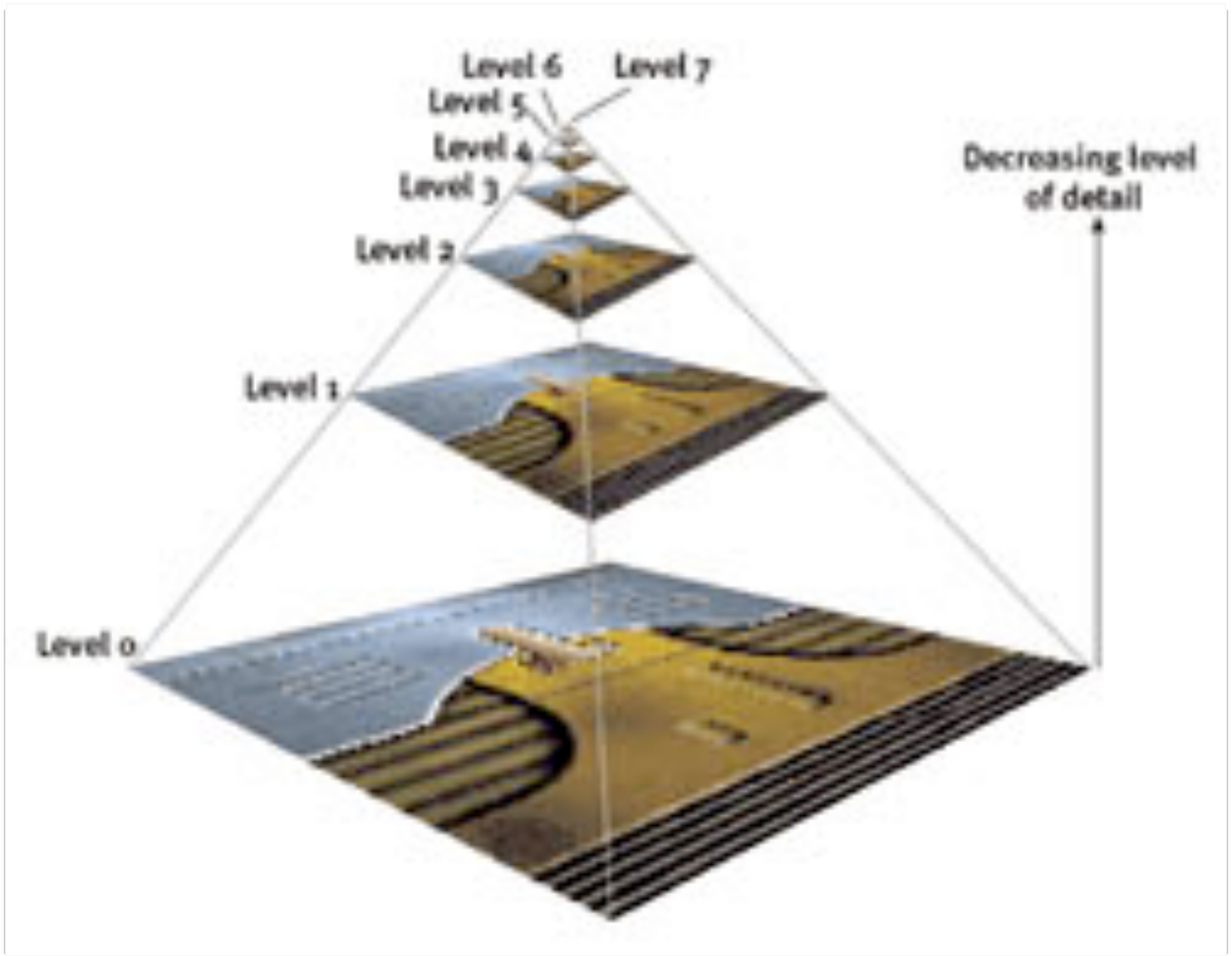


Image Pyramid



Other Membranes

SIGGRAPH 2009

Coordinates for Instant Image Cloning

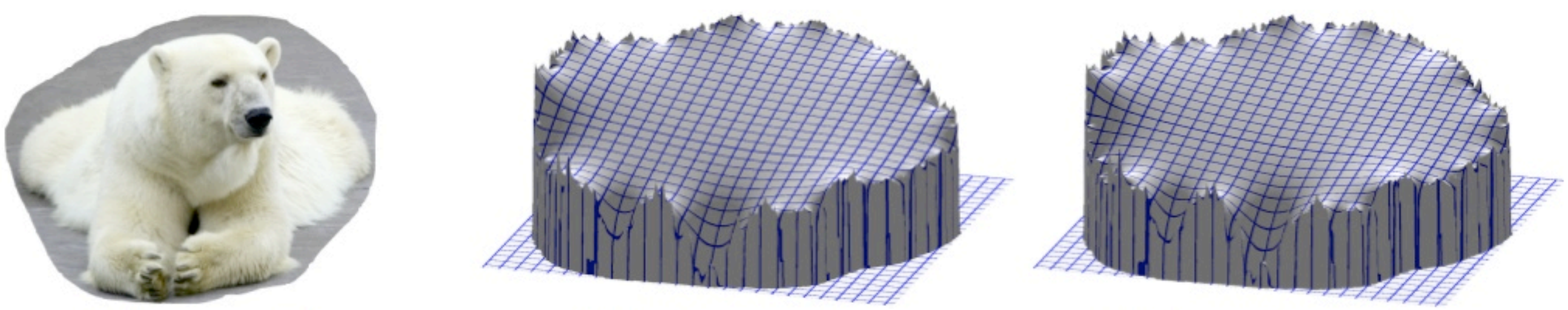
Zeev Farbman
The Hebrew University

Gil Hoffer
Tel Aviv University

Yaron Lipman
Princeton University

Daniel Cohen-Or
Tel Aviv University

Dani Lischinski
The Hebrew University



(a) Source patch (b) Laplace membrane (c) Mean-value membrane

$$\lambda_i(\mathbf{x}) = \frac{w_i}{\sum_{j=0}^{m-1} w_j}, \quad i = 0, \ldots, m-1,$$

where

$$w_i = \frac{\tan(\alpha_{i-1}/2) + \tan(\alpha_i/2)}{\|\mathbf{p}_i - \mathbf{x}\|},$$