

Gradient Domain image processing

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Poisson image editing

$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \psi)^2 + \left| \nabla \phi - \vec{v} \right|^2 dp$$

$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \psi)^2 + \left| \nabla \phi - \vec{v} \right|^2 dp$$

Target image Target gradient

$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \psi)^2 + \left| \nabla \phi - \vec{v} \right|^2 dp$$

Unknown

Target image

Target gradient

$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \phi_0)^2 + \left| \nabla \phi - \beta \nabla \phi_0 \right|^2 dp$$



$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \phi_0)^2 + \left| \nabla \phi - \beta \nabla \phi_0 \right|^2 dp$$

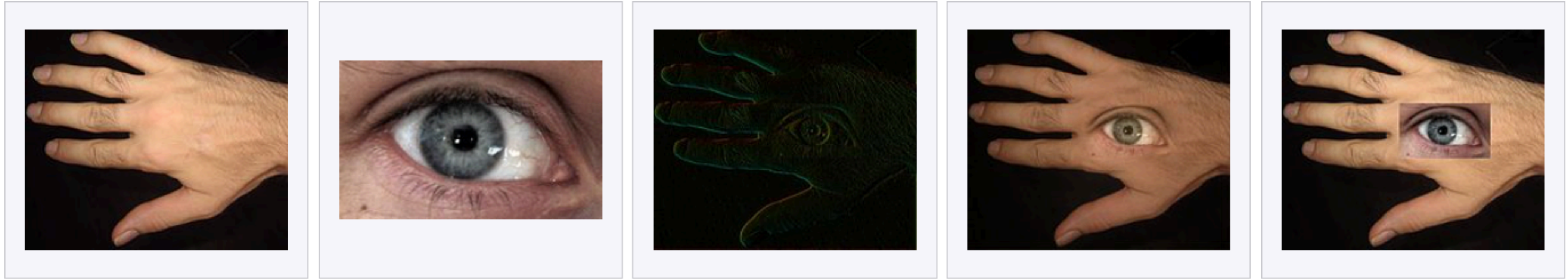
 α  β

α

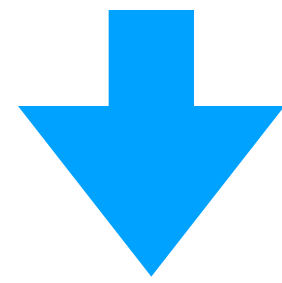
$$\arg \min_{\phi} \int_{\Omega} \alpha (\phi - \phi_0)^2 + \left| \nabla \phi - \beta \nabla \phi_0 \right|^2 dp$$

 β

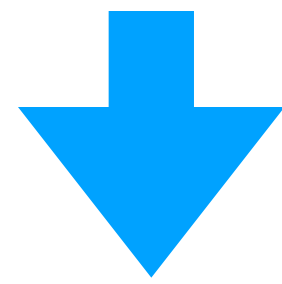
Poisson Image Editing



$$\min_f \iint_{\Omega} |\nabla f - \mathbf{v}|^2 \text{ with } f|_{\partial\Omega} = f^*|_{\partial\Omega},$$



$$\Delta f = \text{div} \mathbf{v} \text{ over } \Omega, \text{ with } f|_{\partial\Omega} = f^*|_{\partial\Omega},$$



Poisson problem



sources

destinations

cloning

seamless cloning



sources/destinations

cloning

seamless cloning