

## Frame Camera

$$x = x_0 - f \frac{m_{11}(x-x_c) + m_{12}(y-y_c) \dots}{m_{31}(x-x_c) + m_{32}(y-y_c) \dots}$$

$$y = y_0 - f \frac{\vdots}{\vdots}$$

closed form

$$F_2(l, s, \phi, \lambda, h, eph, att, d) = 0$$

$$F_3(l, s, \phi, \lambda, h, eph, att, d) = 0$$

$$\phi \lambda h \longrightarrow l, s \quad \begin{matrix} \uparrow \\ 2 \text{ equ.} / 2 \text{ unknowns} \end{matrix}$$

$l_0, s_0$  : initial approximations

↑ 6-parameter approx solution

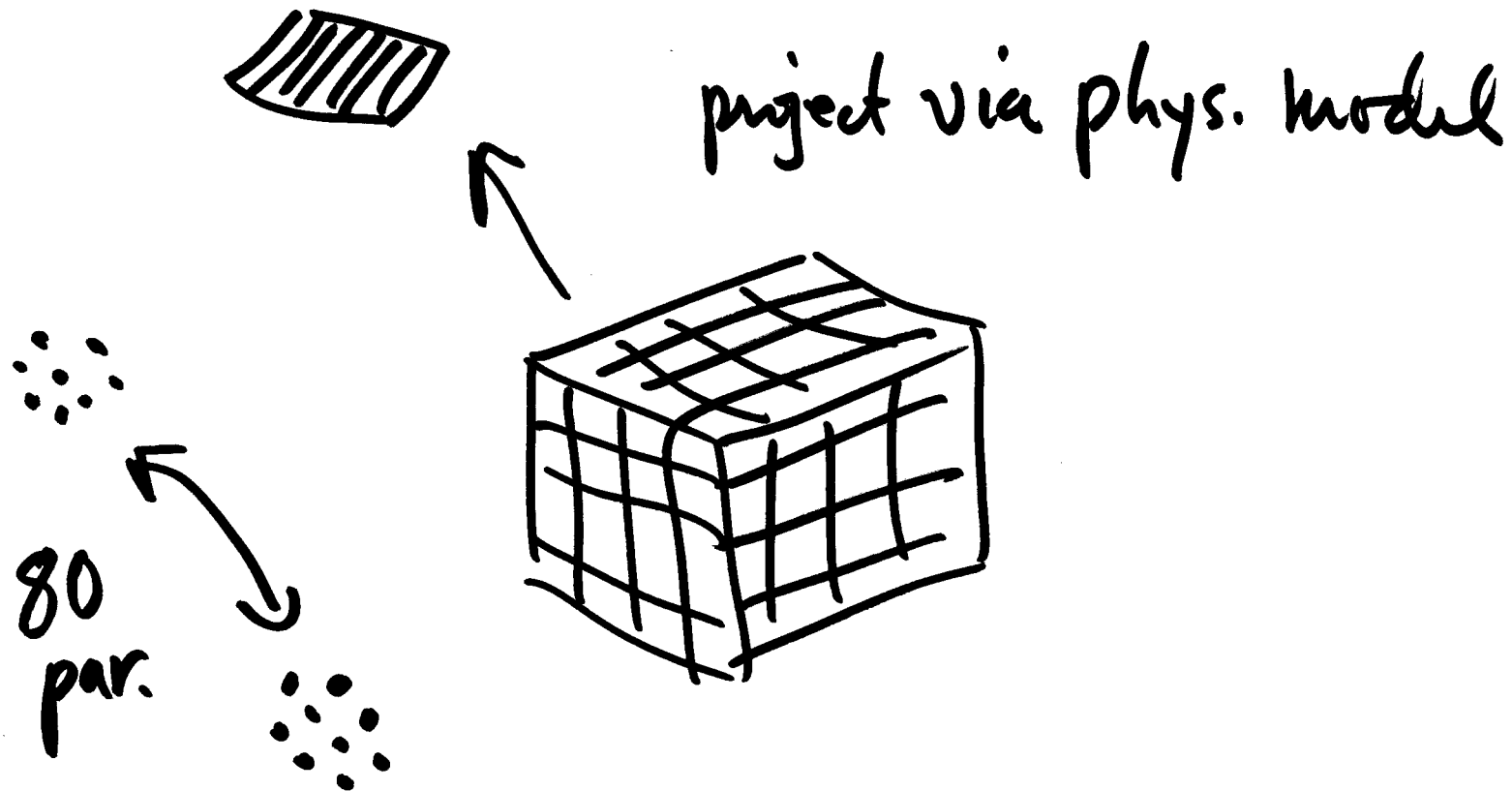
$$(14-11) \quad \vec{X}_{i+1} = \vec{X}_i - \mathbf{J}^{-1} \vec{F}(\vec{X}_i)$$

$$\begin{pmatrix} l_1 \\ s_1 \end{pmatrix} = \begin{pmatrix} l_0 \\ s_0 \end{pmatrix} - \underbrace{\begin{bmatrix} \frac{\partial F_e}{\partial l} & \frac{\partial F_e}{\partial s} \\ \frac{\partial F_s}{\partial l} & \frac{\partial F_s}{\partial s} \end{bmatrix}^{-1}}_{\text{correction}} \begin{bmatrix} F_e(l_0, s_0, \dots) \\ F_s(l_0, s_0, \dots) \end{bmatrix}$$

Converges in 1-2 iter.

correction  
 $\Delta X_i$

$$\begin{pmatrix} l \\ s \end{pmatrix} = \begin{pmatrix} a_0 \\ b_0 \end{pmatrix} + \begin{pmatrix} a_1 & a_2 \\ b_1 & b_2 \end{pmatrix} \begin{pmatrix} Q \\ \lambda \end{pmatrix}$$



$$CE/LE \Rightarrow \Sigma = \begin{bmatrix} \sigma_x^2 & \sigma_{xy} & \vdots & \sigma_{xz} \\ \cdot & \sigma_y^2 & \vdots & \sigma_{yz} \\ \text{---} & \text{---} & \text{---} & \text{---} \\ \cdot & \cdot & \vdots & \sigma_z^2 \end{bmatrix}$$

assume: errors normally distributed

$$f(x) = \frac{1}{(2\pi)^{n/2} \sqrt{|\Sigma_x|}} \exp\left[-\frac{1}{2}(x - \mu_x)^T \Sigma_x^{-1} (x - \mu_x)\right]$$

MVN

n: dimension of x

$$f(x) = \frac{1}{\sigma_x \sqrt{2\pi}} \exp \left[ -\frac{1}{2} \left( \frac{x - \mu_x}{\sigma_x} \right)^2 \right]$$

