

- (a) Suppose you have obtained the motion parallax vectors measured at n locations and the equations of straight lines defined by these vectors are as follows:

$$a_i x + b_i y + c_i = 0 \quad \text{for } i = 1, 2, \dots, n$$

Using these motion parallax vectors, find the focus of expansion (FOE) by writing down (without having to solve) the linear least squares equations of the form $\mathbf{Ax} = \mathbf{y}$, where \mathbf{y} may or may not be 0.

- (b) Describe a particular motion which might result in the matrix \mathbf{A} being rank-deficient. Under such condition, is there any meaningful solution? If there is one, then explain what the solution means and how you would obtain it.