

from trigonometry import sin, cos

$$M = \begin{bmatrix} S_v1 & S_v2 \\ S_v2 & S_v3 \end{bmatrix} \begin{bmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{bmatrix}$$
$$v = [(M_{1,1}, M_{2,1})^T TP \quad (M_{1,2}, M_{2,2})^T TP]$$

where

$$TP \in \mathbb{R}^{2 \times 3}$$
$$\theta \in \mathbb{R}$$
$$S_v \in \mathbb{R}^3$$