

from trigonometry import sin, cos

$$M = \begin{bmatrix} S_v_1 & S_v_2 \\ S_v_2 & S_v_3 \end{bmatrix} \begin{bmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{bmatrix}$$
$$v = \begin{bmatrix} (M_{1,1}, M_{2,1})^T TP & (M_{1,2}, M_{2,2})^T TP \end{bmatrix}$$

where

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

$$\theta \in \mathbb{R}$$

$$S_v \in \mathbb{R}^3$$