

from trigonometry import sin, cos

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

where

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