From a practical point of view, Proposition 25.6 shows us how to homogenize an affine map to turn it into a linear map between the two homogenized spaces. Assume that E and F are of finite dimension, that $(a_0, (u_1, \ldots, u_n))$ is an affine frame of E with origin a_0, and $(b_0, (v_1, \ldots, v_m))$ is an affine frame of F with origin b_0. Then, with respect to the two bases $(u_1, \ldots, u_n, a_0)$ in $\widehat{E}$ and $(v_1, \ldots, v_m, b_0)$ in $\widehat{F}$, a linear map $h\colon \widehat{E} \to \widehat{F}$ is given by an $(m+1) \times (n+1)$ matrix A. Assume that this linear map h is equal to the homogenized version $\widehat{f}$ of an affine map f. Since

$$\widehat{f}(u \mathbin{\widehat{+}} \lambda a) = \overrightarrow{f}(u) \mathbin{\widehat{+}} \lambda f(a),$$

and since over the basis $(u_1, \ldots, u_n, a_0)$ in $\widehat{E}$, points are represented by vectors whose last coordinate is 1 and vectors are represented by vectors whose last coordinate is 0, the following properties hold.

1. The last row of the matrix $A = M(\widehat{f})$ with respect to the given bases is
$$(0, 0, \ldots, 0, 1)$$
with n occurrences of 0.

2. The last column of A contains the coordinates
$$(\mu_1, \ldots, \mu_m, 1)$$
of $f(a_0)$ with respect to the basis $(v_1, \ldots, v_m, b_0)$.

3. The submatrix of A obtained by deleting the last row and the last column is the matrix of the linear map $\overrightarrow{f}$ with respect to the bases $(u_1, \ldots, u_n)$ and $(v_1, \ldots, v_m)$,

Finally, since
$$f(a_0 + u) = \widehat{f}(u \mathbin{\widehat{+}} a_0),$$
given any $x \in E$ and $y \in F$ with coordinates $(x_1, \ldots, x_n, 1)$ and $(y_1, \ldots, y_m,\ 1)$, for $X = (x_1, \ldots, x_n, 1)^\top$ and $Y = (y_1, \ldots, y_m, 1)^\top$, we have $y = f(x)$ iff

$$Y = AX.$$

For example, consider the following affine map $f\colon \mathbb{A}^2 \to \mathbb{A}^2$ defined as follows:

$$\begin{aligned} y_1 &= ax_1 + bx_2 + \mu_1, \\ y_2 &= cx_1 + dx_2 + \mu_2. \end{aligned}$$

The matrix of $\widehat{f}$ is

$$\begin{pmatrix} a & b & \mu_1 \\ c & d & \mu_2 \\ 0 & 0 & 1 \end{pmatrix},$$