and let

$$P(X) = \sum_{j=0,i=0}^{j=m,i=n_{j+1}} \lambda_j^i P_j^i(X).$$

We can think of $P(X)$ as a generalized Newton interpolant. We can compute the derivatives $\mathrm{D}^k P_j^i$, for $1 \leq k \leq n_{j+1}$, and if we look for the Hermite basis polynomials $H_j^i(X)$ such that $\mathrm{D}^i H_j^i(\alpha_j) = 1$ and $\mathrm{D}^k H_j^i(\alpha_l) = 0$, for $k \neq i$ or $l \neq j$, $1 \leq j, l \leq m+1$, $0 \leq i, k \leq n_j$, we find that we have to solve triangular systems of linear equations. Thus, as in the simple case $n_1 = \ldots = n_{m+1} = 0$, we can solve successively for the λ_j^i. Obviously, the computations are quite formidable and we leave such considerations for further study.