Álgebra Linear - UFFS - Ciência da Computação

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$T: \mathbb{R}^3 \to \mathbb{R}^3$

1- $a = 0 \rightarrow N(T) = [(0, -1, +1)]$

$(0, -1, +1) \in \beta$ $\beta = \{(0, -1, +1); (1, 0, 0); (0, -1, 0)\} \subset \mathbb{R}^3$

Base Canônica

$B' \; Im_T = \mathbb{R}^3$ $B' = \{(1, 0, 0); (0, 1, 0); (0, 0, 1)\} \subset \mathbb{R}$

$$\begin{cases} T(0, -1, +1) := (0, 0, 0) \\ T(1, 0, 0) := (1, 0, 0) \\ T(0, -1, 0) := (0, 1, 0) \end{cases}$$

• $(x, y, z) = a(0, -1, +1) + b(1, 0, 0) + c(0, -1, 0)$

• $(x, y, z) = (a + b, a + c, a)$

$a = z \quad b = (x - z) \quad c = (y - x)$

$T(x, y, z) = T(z(0, -1, 1)) + T((x - z)(1, 0, 0)) + T((y - x).(0, -1, 0))$

$T(x, y, z) = z(0, 0, 0) + (x - z)(1, 0, 0) + (y - x).(0, 1, 0)$

$T(x, y, z) = (x - z, y - x, 0) = T: \mathbb{R}^3 \to \mathbb{R}^3$

2- $T: \mathbb{R}^4 \to \mathbb{R}^3$ $\quad Im(T) = [(0,-1,0),(0,-1,1)]$

$B = \{(1,0,0,0),(0,1,0,0),(0,0,1,0),(0,0,0,1)\}$

$\begin{cases} T(1,0,0,0) = (0,-1,0) \\ T(0,1,0,0) = (0,-1,1) \\ T(0,0,1,0) = (0,0,0) \\ T(0,0,0,1) = (0,0,0) \end{cases}$

$\bullet (x,y,z,w) = x(1,0,0,0) + y(0,1,0,0) + z(0,0,1,0) + w(0,0,0,1)$

$T(x,y,z,w) = x(0,-1,0) + y(0,-1,1)$

$T(x,y,z,w) = (0,-2y,z)$

$T: \mathbb{R}^4 \to \mathbb{R}^3$

$T: (x,y,z,w) = (0,-2y,z)$ $\quad Im\,T = [(0,-1,0);(0,-1,1)]$

3- $T: P_3\mathbb{R} \to P_2\mathbb{R}$

$\begin{cases} T(0+x) = 2 \\ T(x^3+x^2) = x^2+2x \end{cases}$

$\begin{cases} T(0+x) = 2 \\ x2 + 2x \end{cases}$

$B = \{0, x, x^2\}$

$x + yt + zt^2 = x^2 + 2x$

$\hookrightarrow x^3 + 2x^2 + 2x + 2 = 0$