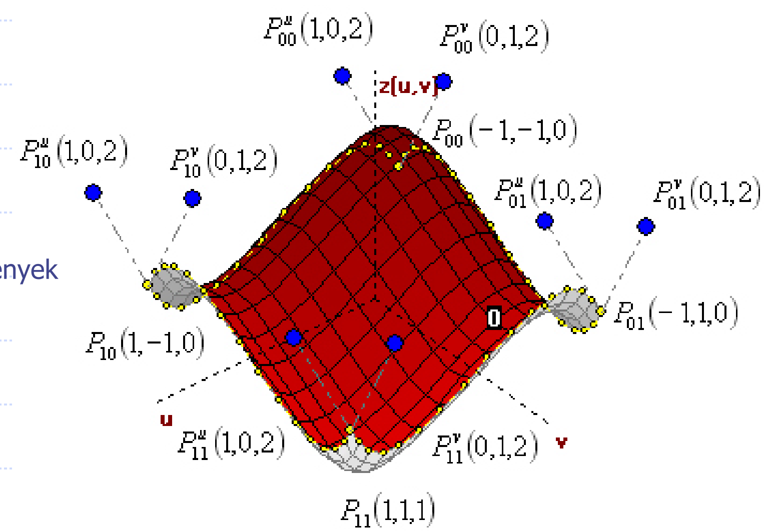
Harmadfokú Coons – Hermite foltok

$$F:[0,1]\times[0,1]\to R^3$$

$$F(u,v)=\begin{bmatrix}H_{00}(u) & H_{10}(u) & H_{01}(u) & H_{11}(u)\end{bmatrix}\begin{bmatrix}P_{00} & P_{01} & P_{00}^{v} & P_{01}^{v}\\ P_{10} & P_{11} & P_{10}^{v} & P_{11}^{v}\\ P_{00}^{u} & P_{01}^{u} & P_{00}^{uv} & P_{01}^{uv}\\ P_{10}^{u} & P_{11}^{u} & P_{10}^{uv} & P_{11}^{uv}\end{bmatrix}\begin{bmatrix}H_{00}(v)\\ H_{10}(v)\\ H_{01}(v)\\ H_{11}(v)\end{bmatrix}$$

$$\begin{cases}T_{00}:=P_{00}^{uv}\\ T_{01}:=P_{01}^{uv}\\ T_{10}:=P_{10}^{uv}\\ T_{11}:=P_{11}^{uv}\end{cases}$$ ún. twistvektorok (csavaródás)

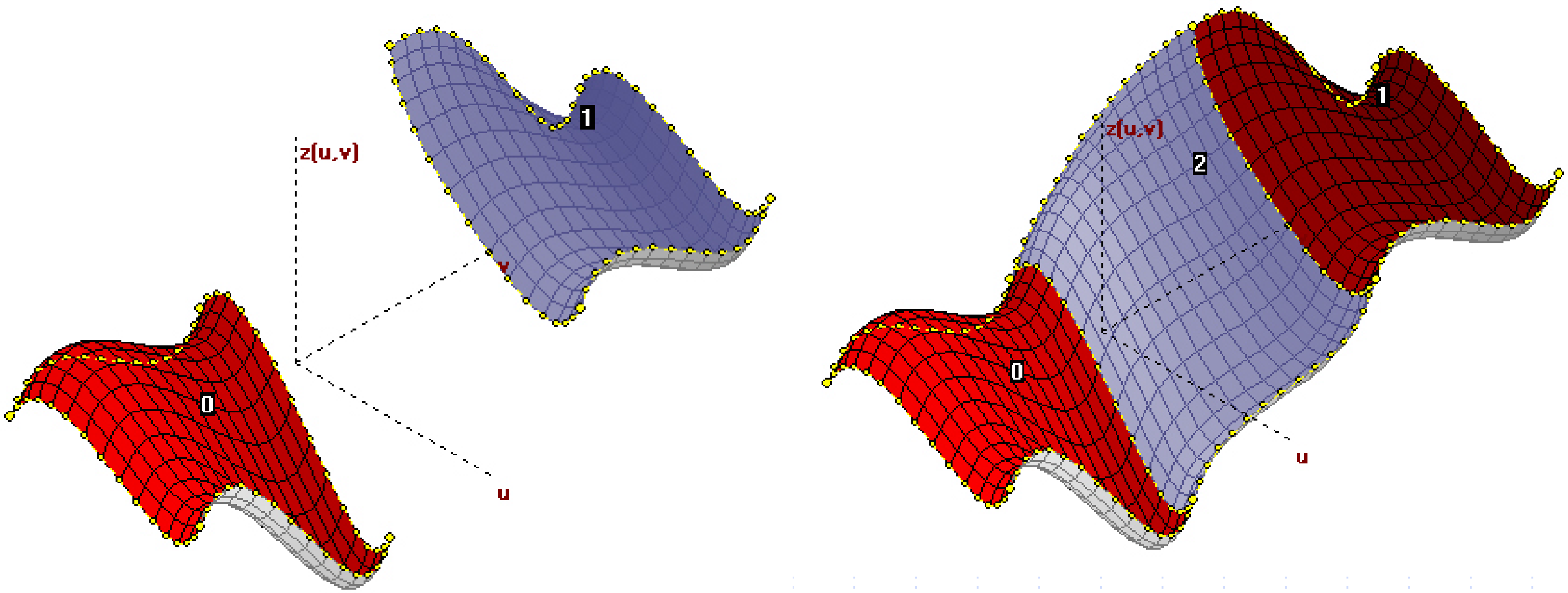
$$\begin{cases}H_{00}(t)=2t^3-3t^2+1\\ H_{10}(t)=-2t^3+3t^2\\ H_{01}(t)=t^3-2t^2+t\\ H_{11}(t)=t^3-t^2\end{cases},\quad t\in[0,1]$$ ún. Hermite-féle súlyfüggvények



$$T_{00}=T_{01}=T_{10}=T_{11}=(0,0,0)$$

Harmadfokú Coons foltok C^1 osztályú illesztése

C^1 osztályú illesztés = a felület folytonos és az érintősík is folytonosan változik



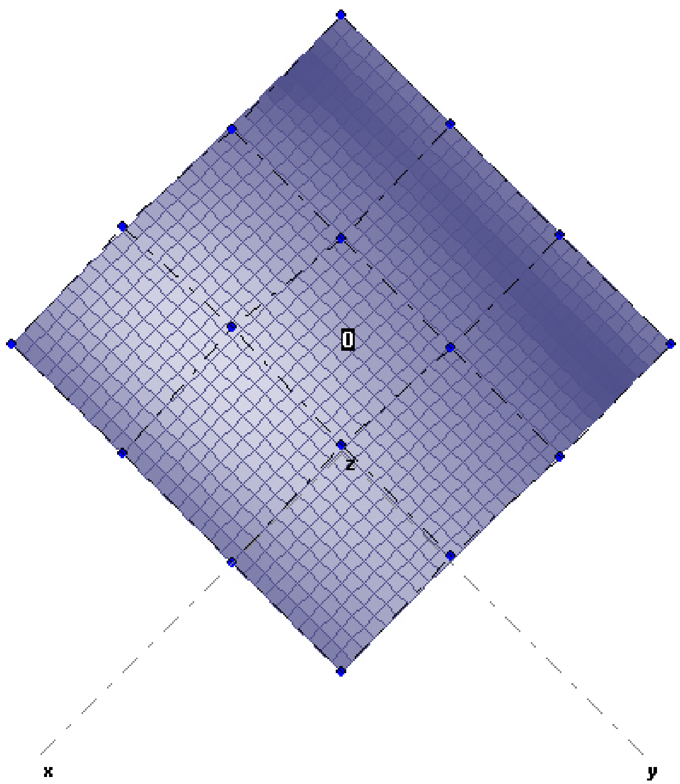
az említett simaság feltétele: a határgörbék mentén az összes információ meg kell egyezzen (kontrollpontok, érintővektorok, twistvektorok)

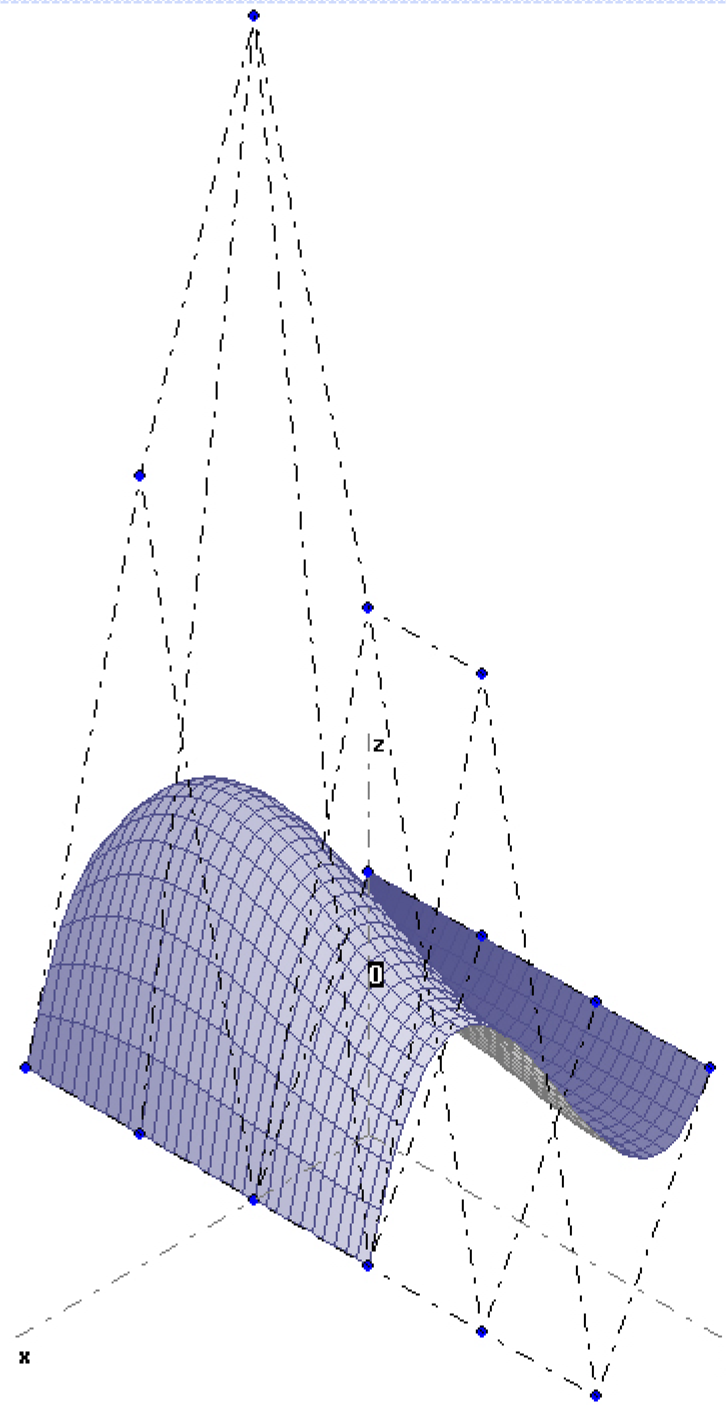
Harmadrendű Bézier – foltok

$F:[0,1]\times[0,1]\rightarrow R^3$

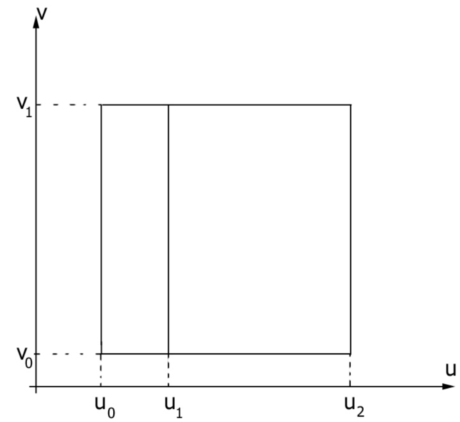
$F(u,v)=\sum_{i=0}^{3}\sum_{j=0}^{3}P_{ij}B_3^i(u)B_3^j(v)$, ahol

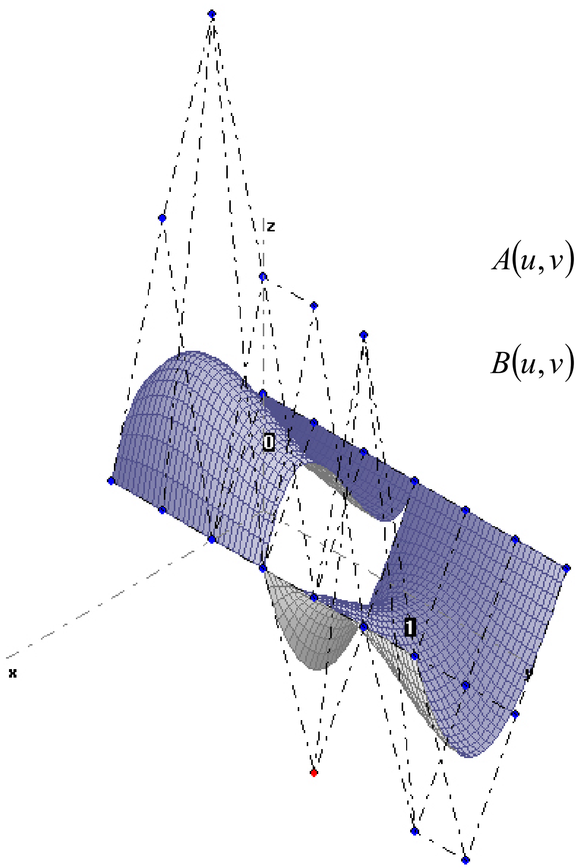
$B_n^k(t)=\binom{n}{k}t^k(1-t)^{n-k},\ \ t\in[0,1]$ – ún. Bernstein polinom





Harmadrendű Bézier – foltok C^1 osztályú illesztése





$$A(u,v)=\sum_{i=0}^{3}\sum_{j=0}^{3}A_{ij}B_3^i\left(\frac{u-u_0}{u_1-u_0}\right)B_3^j\left(\frac{v-v_0}{v_1-v_0}\right),\ u\in[u_0,u_1],\ v\in[v_0,v_1]$$

$$B(u,v)=\sum_{i=0}^{3}\sum_{j=0}^{3}B_{ij}B_3^i\left(\frac{u-u_0}{u_1-u_0}\right)B_3^j\left(\frac{v-v_0}{v_1-v_0}\right),\ u\in[u_1,u_2],\ v\in[v_0,v_1]$$

$$\frac{1}{\Delta u_0}\left(A_{3,j}-A_{2,j}\right)=\frac{1}{\Delta u_1}\left(B_{1,j}-B_{0,j}\right),\ j=\overline{0,3}$$

$$\Delta u_i := u_{i+1}-u_i$$