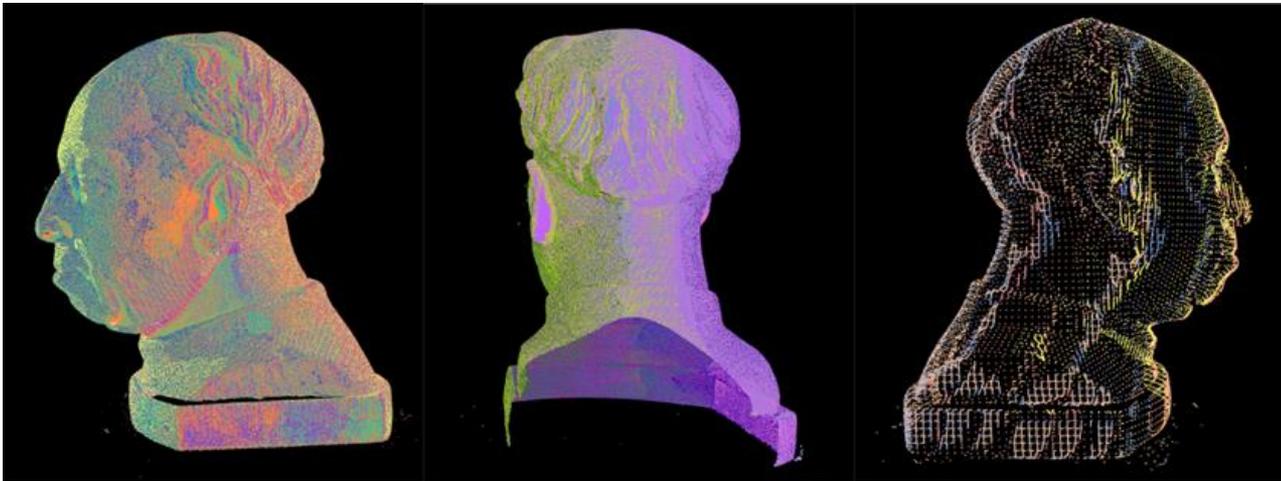


Rekonštrukcia objektov pomocou vývoja plôch

Matej Medľa

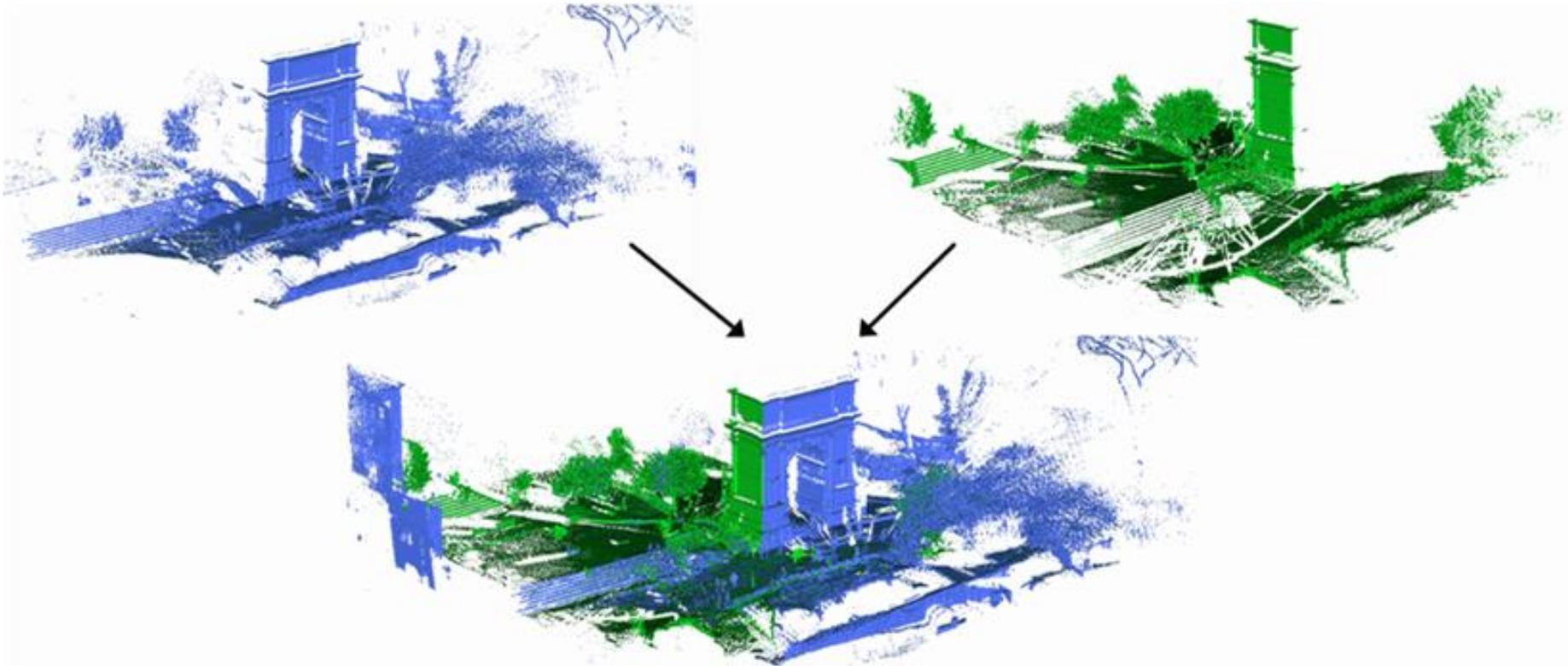
Motivácia

- Archeológia
 - Rekonštrukcia historických pamätihodností a predmetov



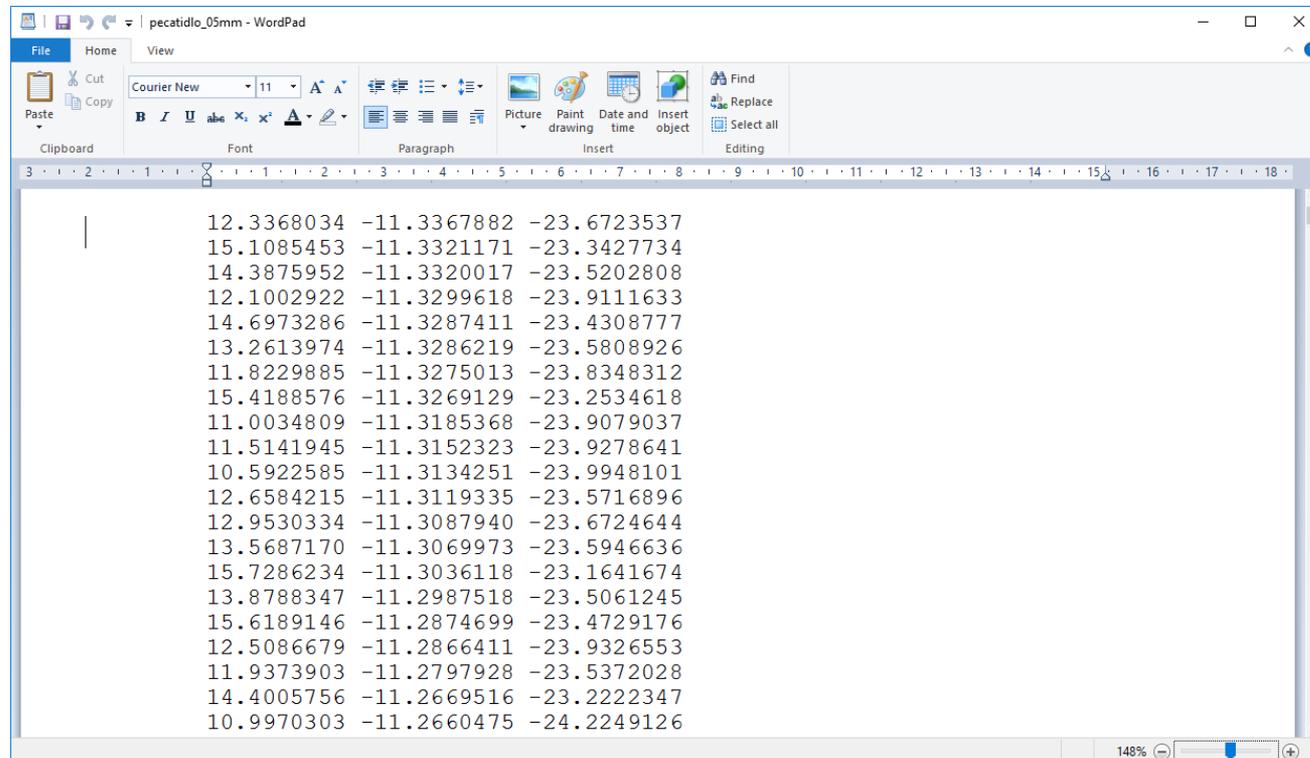
Motivácia

- Architektúra



Mračno bodov

- Množina bodov v 3D priestore (optimálne informácie o farbe, intenzite,...)
- Popisuje povrch objektu

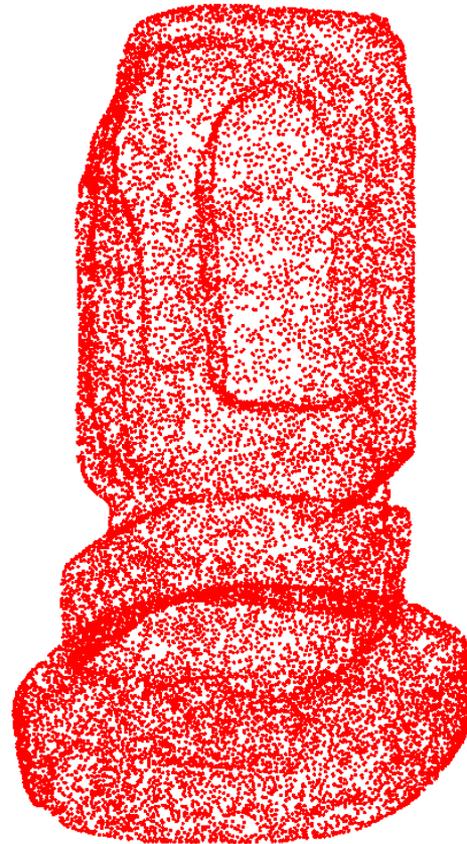


The screenshot shows a WordPad window titled "pecatidlo_05mm - WordPad". The window contains a list of 20 rows of 3D coordinates, each row consisting of three floating-point numbers separated by spaces. The coordinates are as follows:

12.3368034	-11.3367882	-23.6723537
15.1085453	-11.3321171	-23.3427734
14.3875952	-11.3320017	-23.5202808
12.1002922	-11.3299618	-23.9111633
14.6973286	-11.3287411	-23.4308777
13.2613974	-11.3286219	-23.5808926
11.8229885	-11.3275013	-23.8348312
15.4188576	-11.3269129	-23.2534618
11.0034809	-11.3185368	-23.9079037
11.5141945	-11.3152323	-23.9278641
10.5922585	-11.3134251	-23.9948101
12.6584215	-11.3119335	-23.5716896
12.9530334	-11.3087940	-23.6724644
13.5687170	-11.3069973	-23.5946636
15.7286234	-11.3036118	-23.1641674
13.8788347	-11.2987518	-23.5061245
15.6189146	-11.2874699	-23.4729176
12.5086679	-11.2866411	-23.9326553
11.9373903	-11.2797928	-23.5372028
14.4005756	-11.2669516	-23.2222347
10.9970303	-11.2660475	-24.2249126

Mračno bodov

- Množina bodov v 3D priestore
- Popisuje povrch objektu



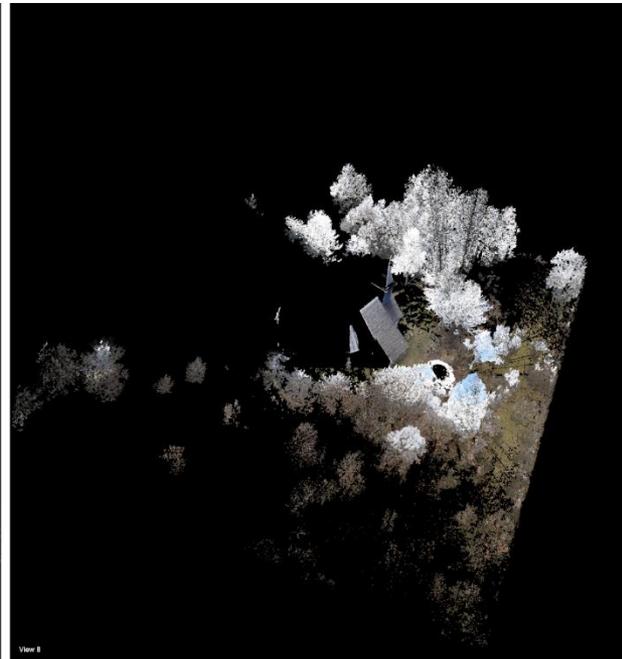
Skenovanie

- Laserové skenery
 - Riegl, Leica Geosystems
 - 500 000 – 1000 000 bodov za sekundu



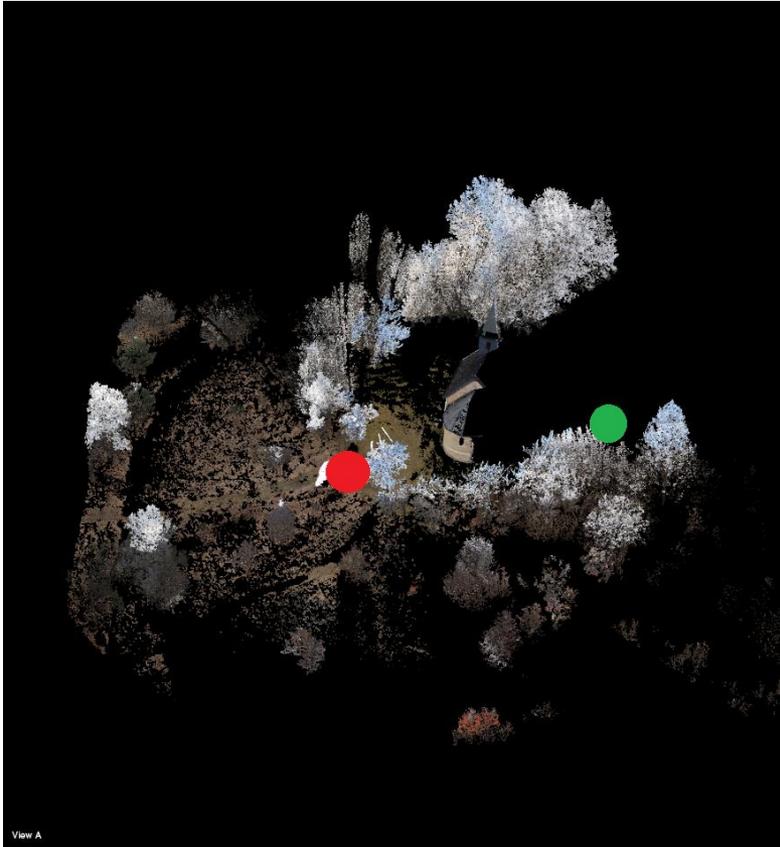
Registrácia bodov

- Zarovnanie viacerých mračien bodov do jedného mračna
 - Začiatok súradnicovej sústavy je v mieste skeneru
 - Súradnicové sústavy môžu byť navzájom natočené
- Spolupráca s Pamiatkovým úradom SR (Ing. Jana Brehovská, PhD.)

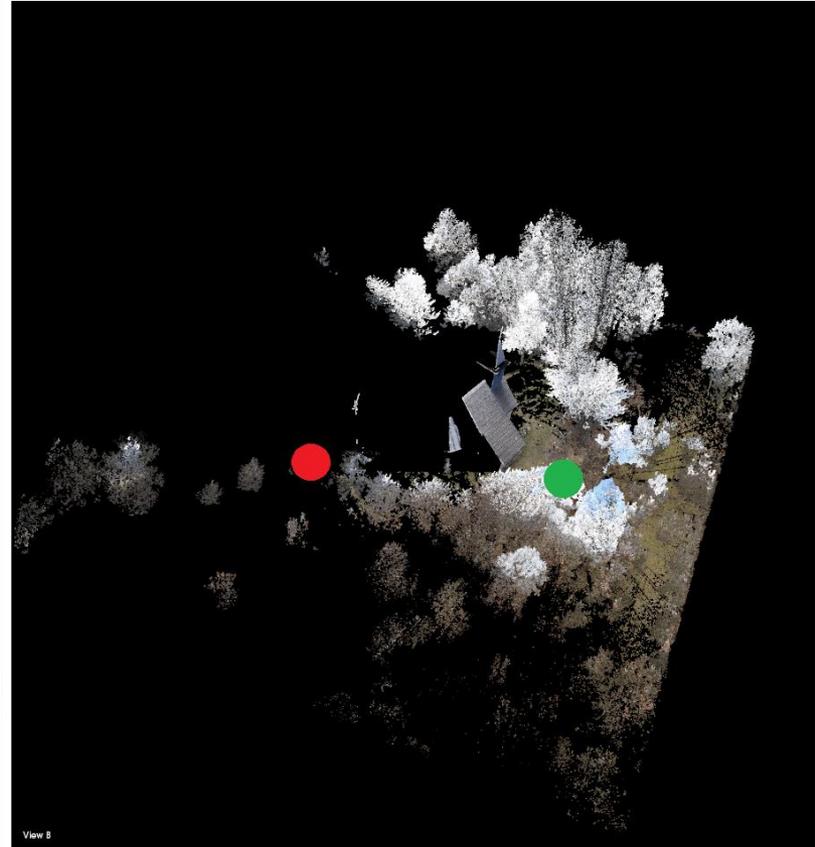


Registrácia bodov

Sken A:



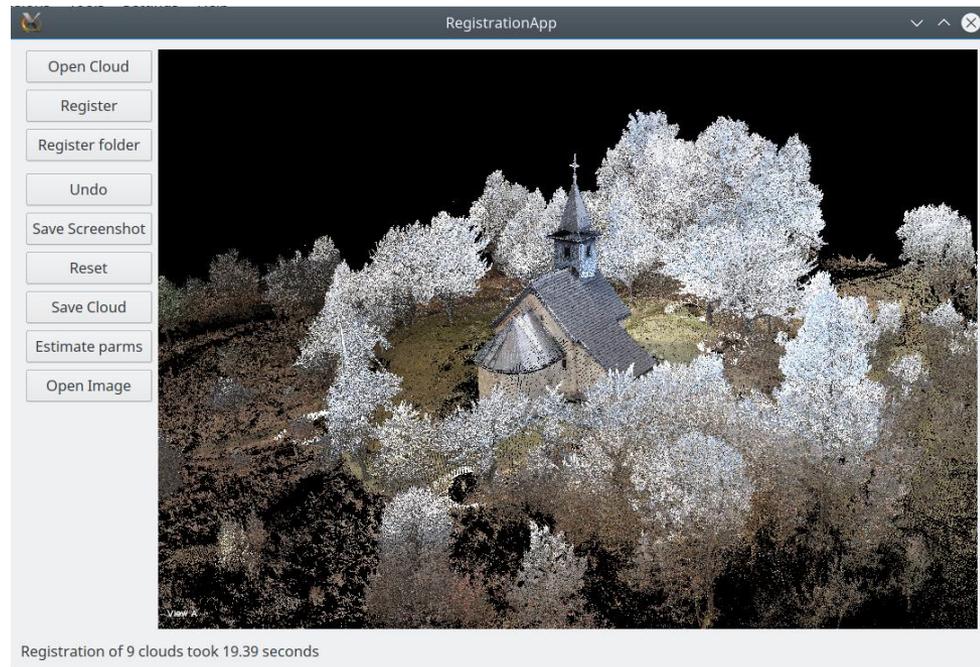
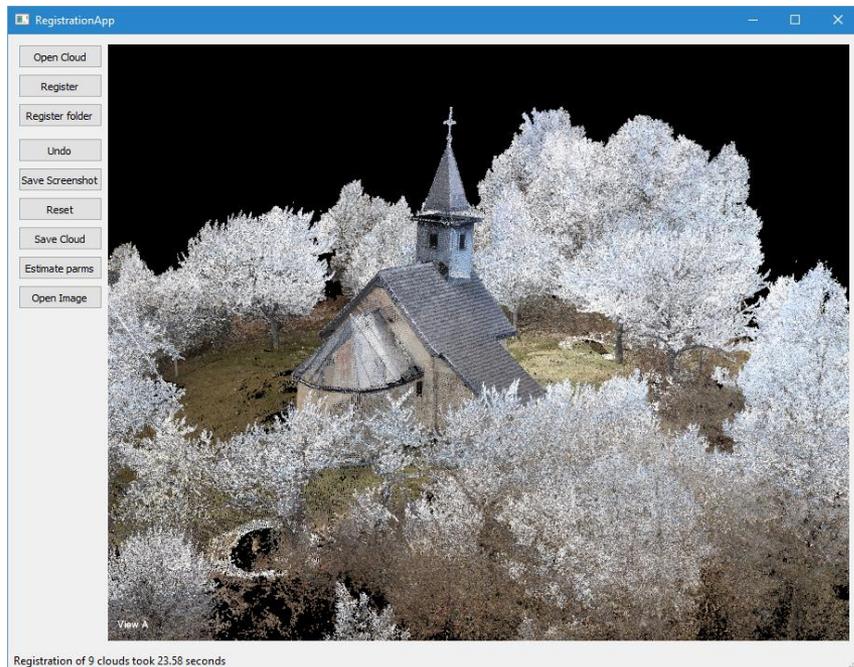
Sken B:



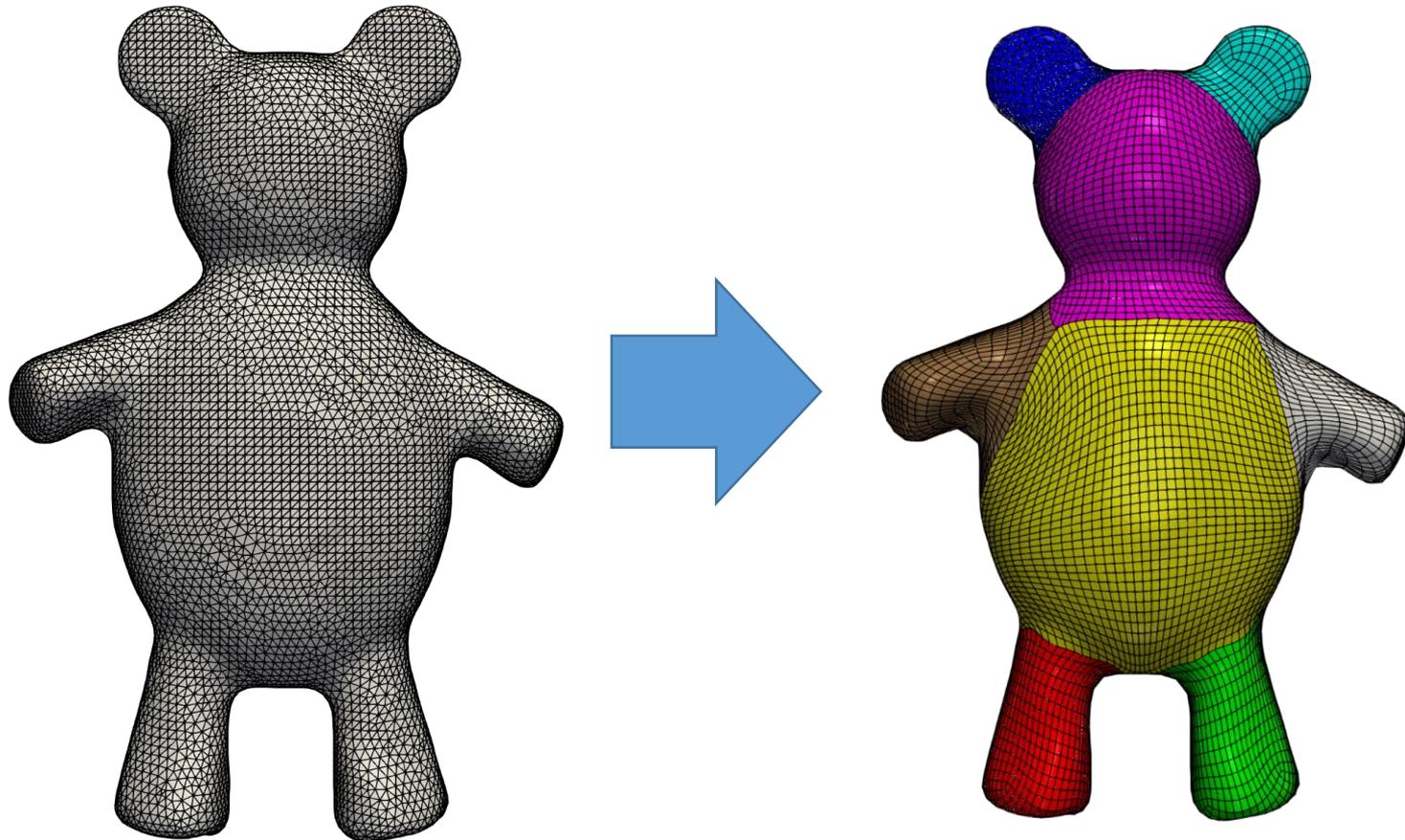
Začiatok súradnicovej sústavy skenu A

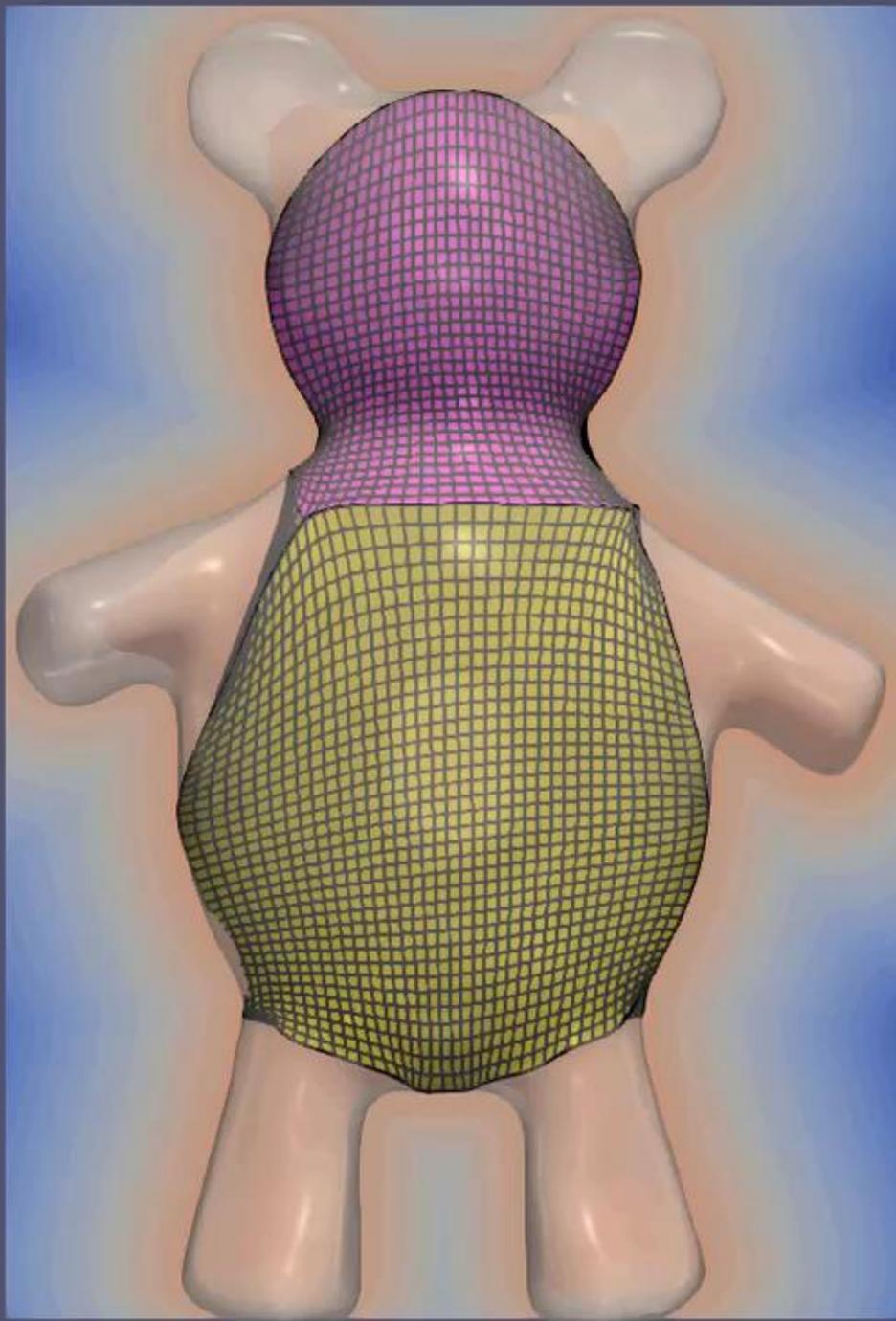
Začiatok súradnicovej sústavy skenu B

Spojené mračná



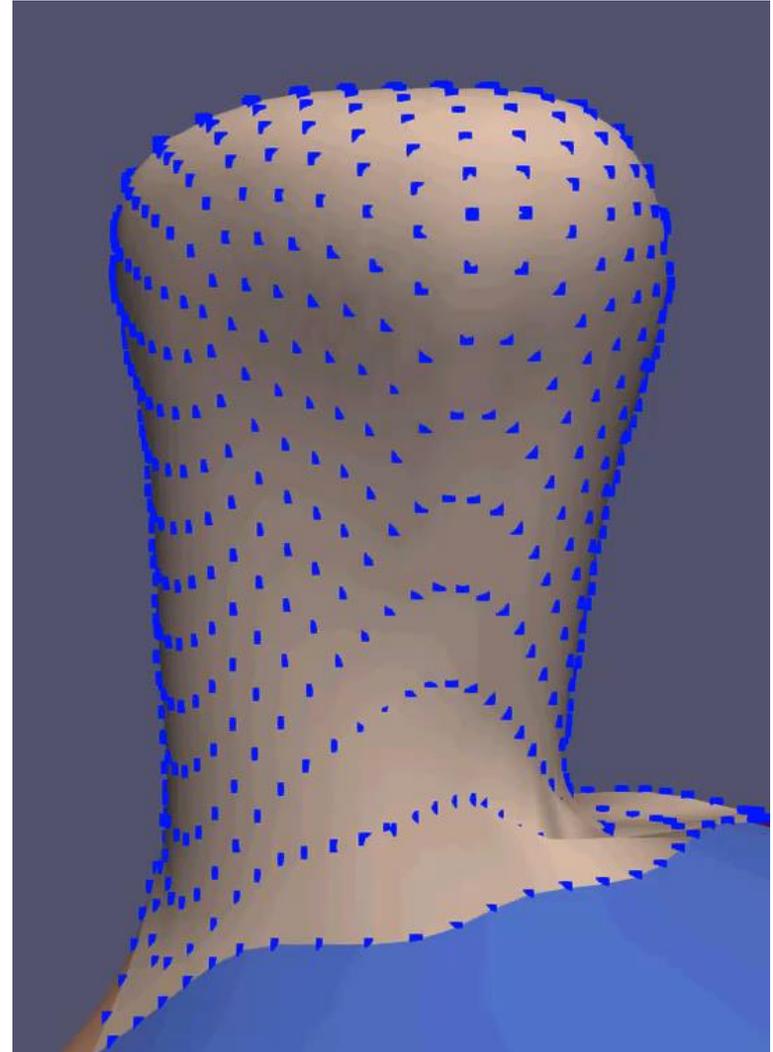
Konverzia trojuholníkovej siete na štvoruholníkovú





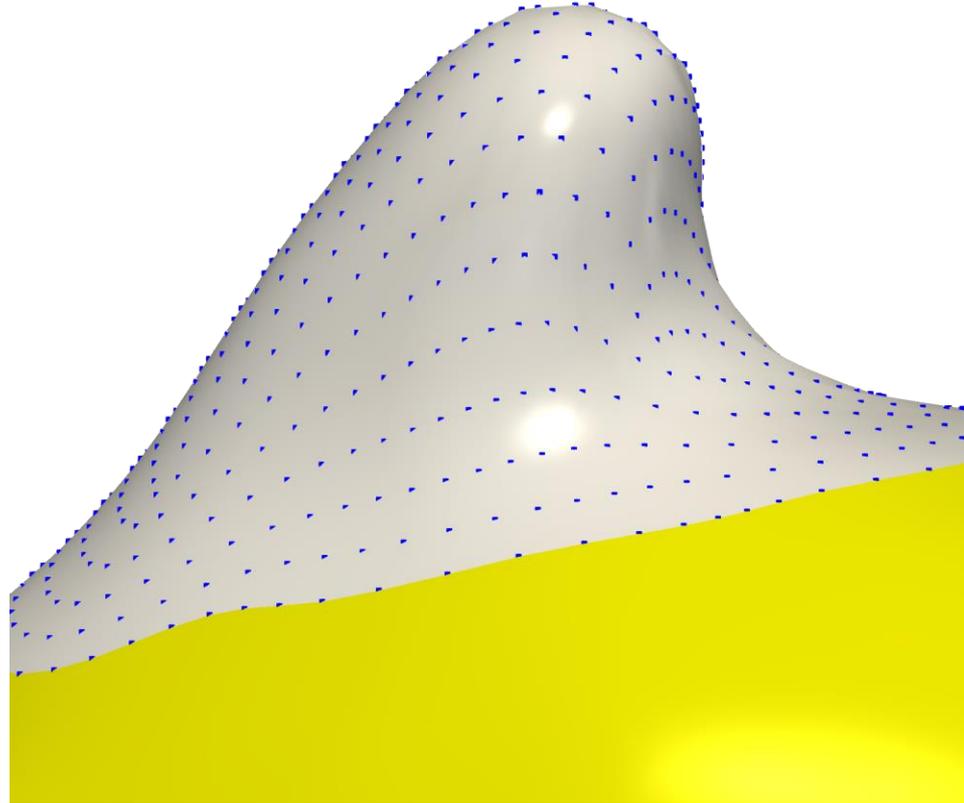
Rovnica riadiaca vývoj

- $\partial_t \mathbf{x} = \alpha \mathbf{N} + \mathbf{V}_T$



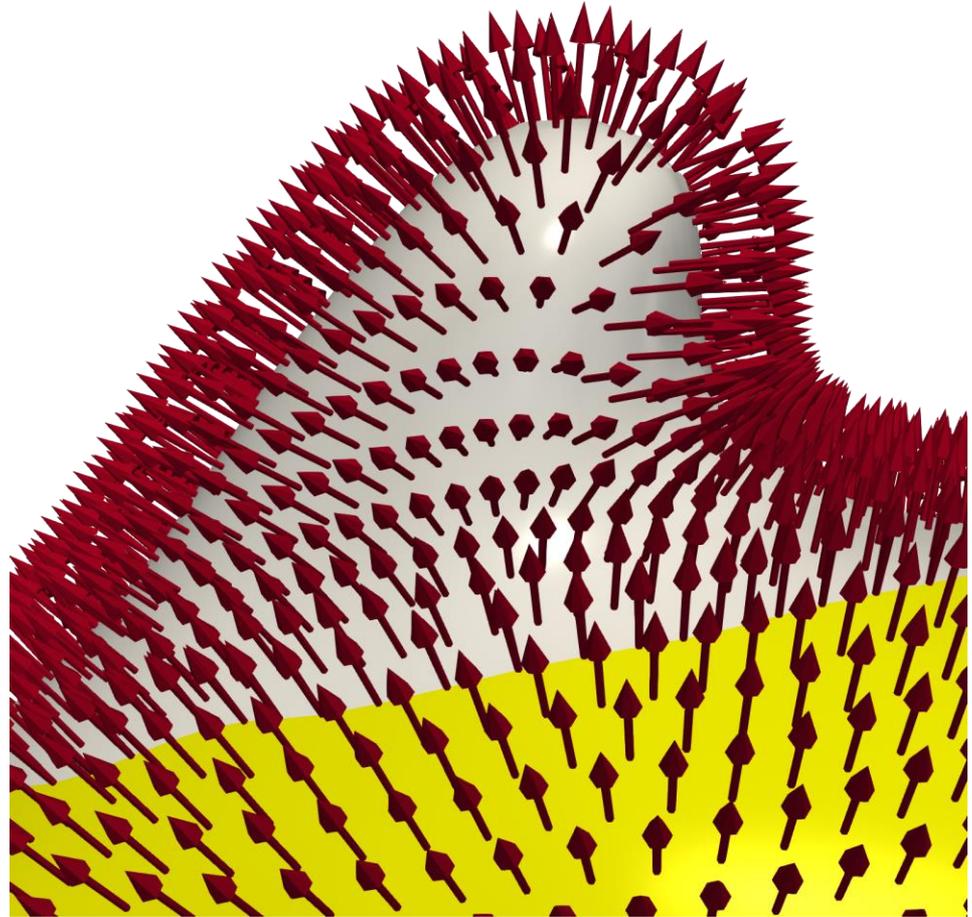
Rovnica radiaca vývoj

- $\partial_t \mathbf{x} = -d(\mathbf{x})(\nabla d(\mathbf{x}) \cdot \mathbf{N})\mathbf{N} + f\mathbf{N} - \varepsilon(d(\mathbf{x}))k\mathbf{N} + \mathbf{V}_T$



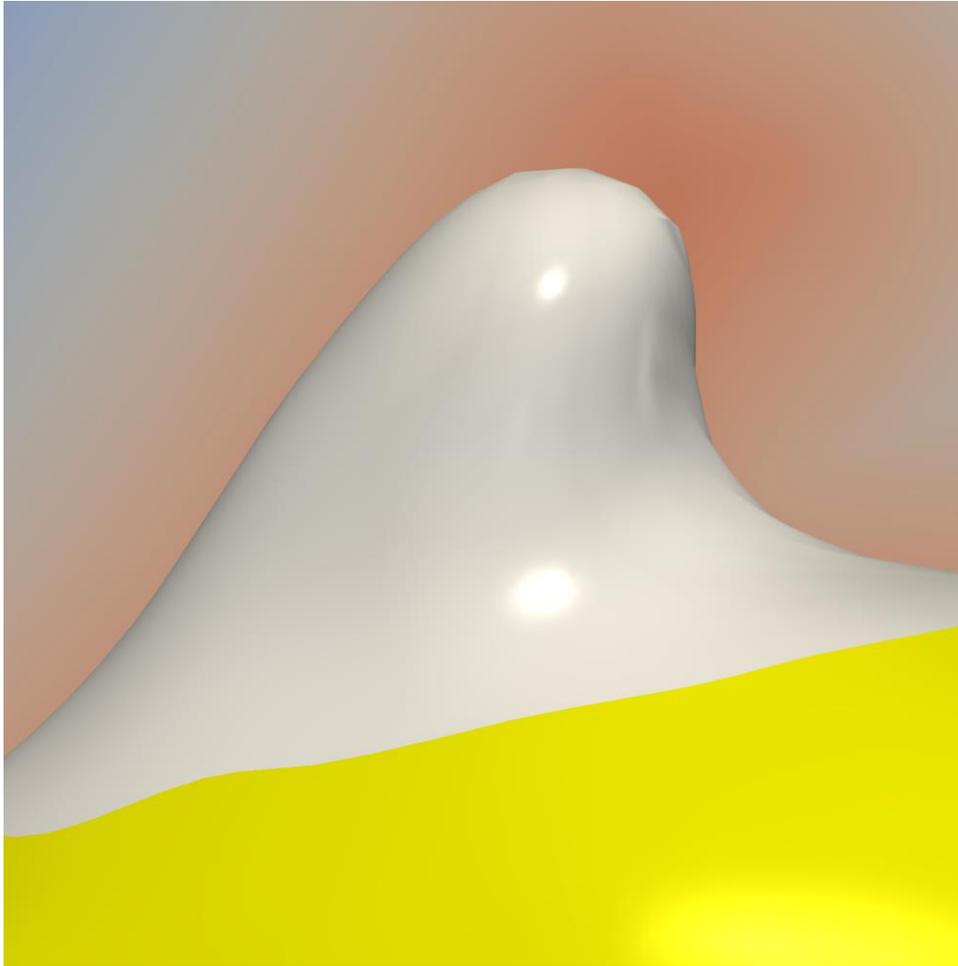
Rovnica radiaca vývoj

- $\partial_t \mathbf{x} = -d(\mathbf{x})(\nabla d(\mathbf{x}) \cdot \mathbf{N})\mathbf{N} + f\mathbf{N} - \varepsilon(d(\mathbf{x}))k\mathbf{N} + \mathbf{V}_T$



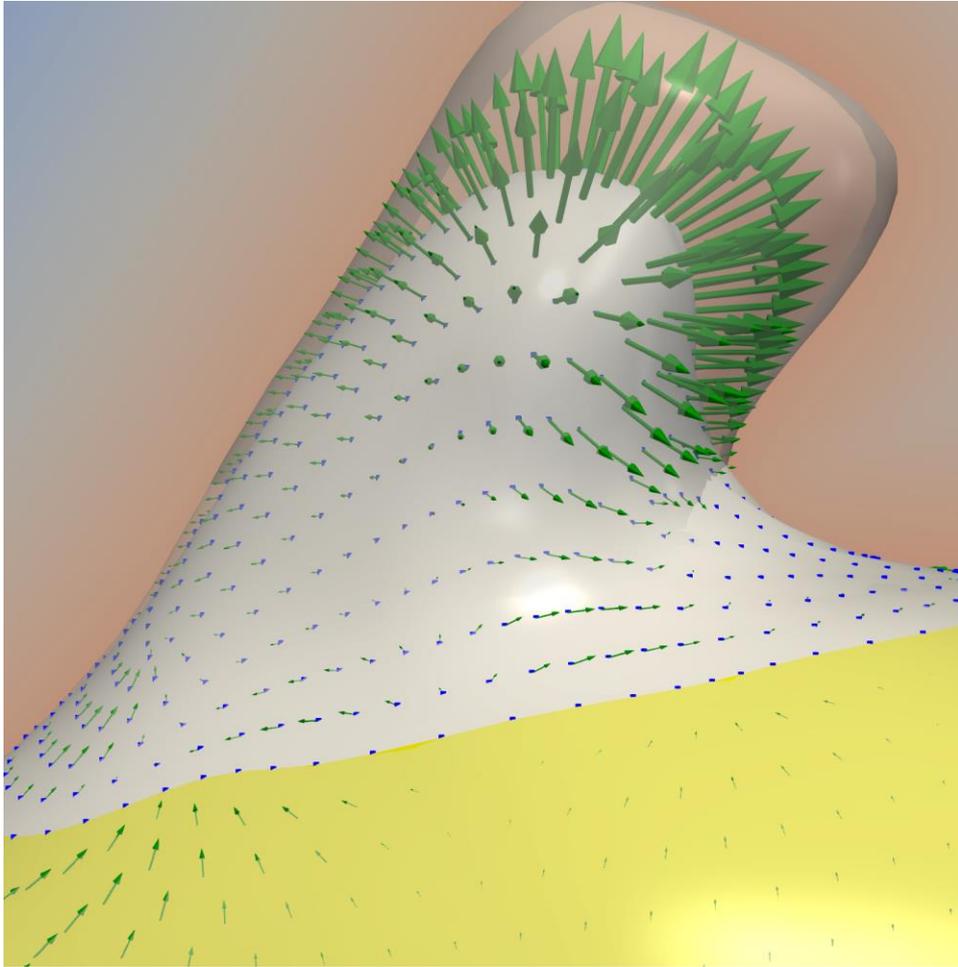
Rovnica radiaca vývoj

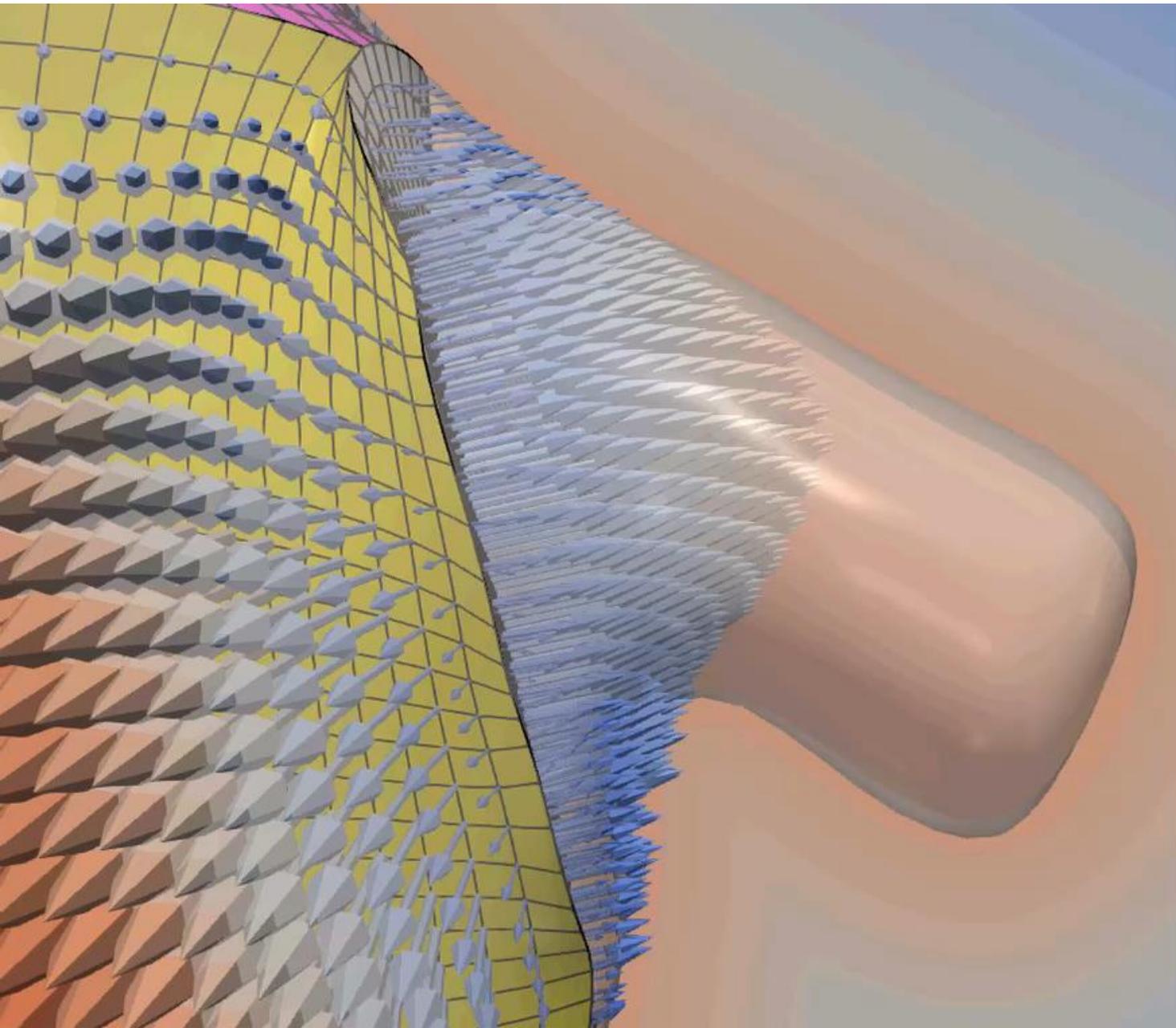
- $\partial_t \mathbf{x} = -d(\mathbf{x})(\nabla d(\mathbf{x}) \cdot \mathbf{N})\mathbf{N} + f\mathbf{N} - \varepsilon(d(\mathbf{x}))k\mathbf{N} + \mathbf{V}_T$

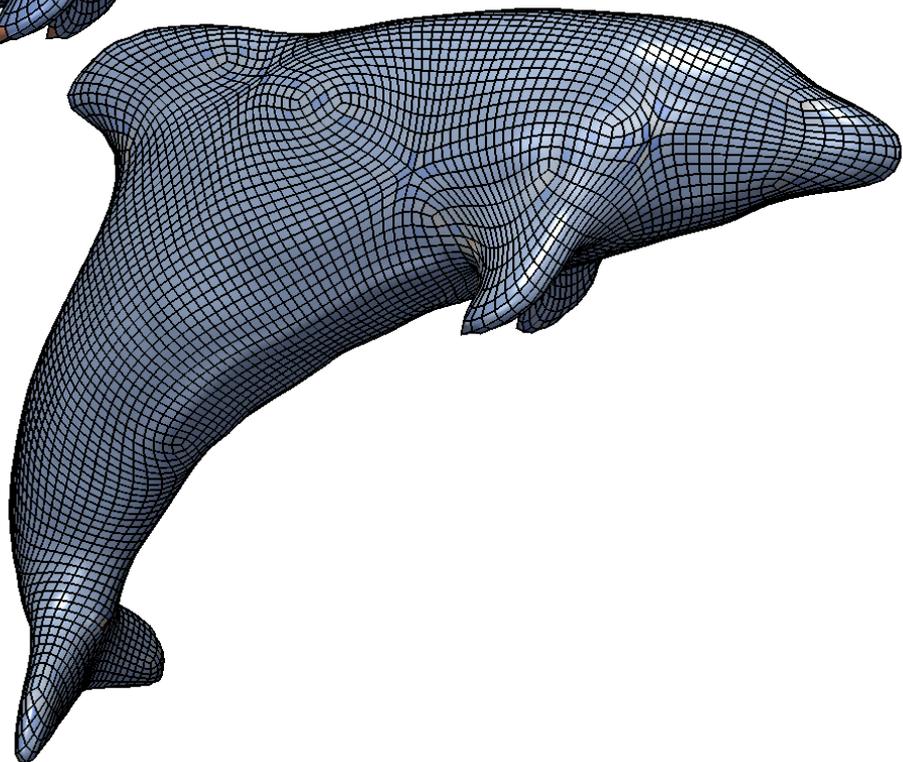
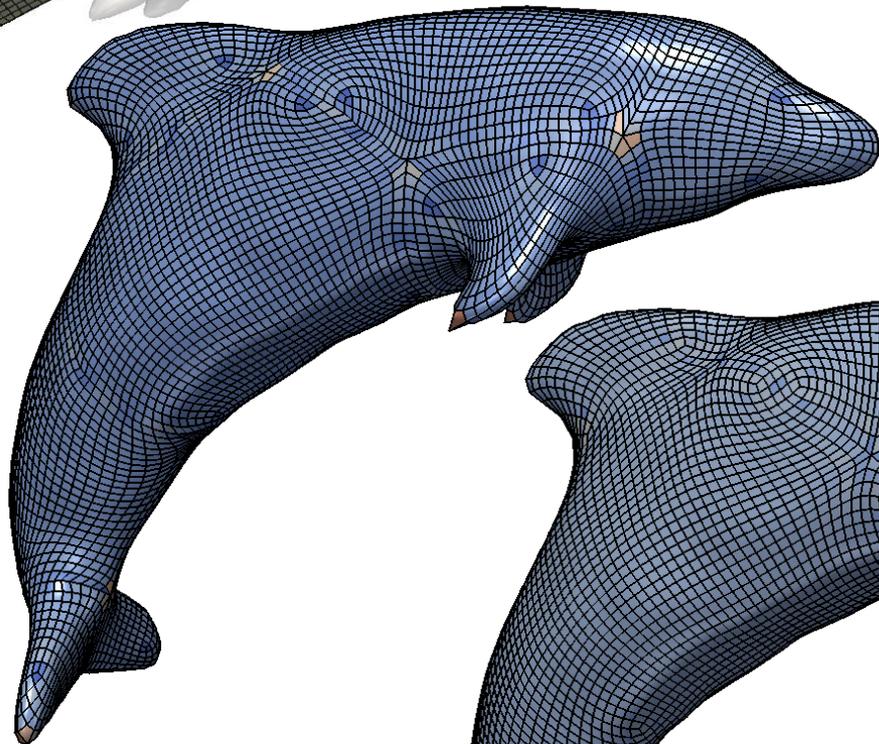
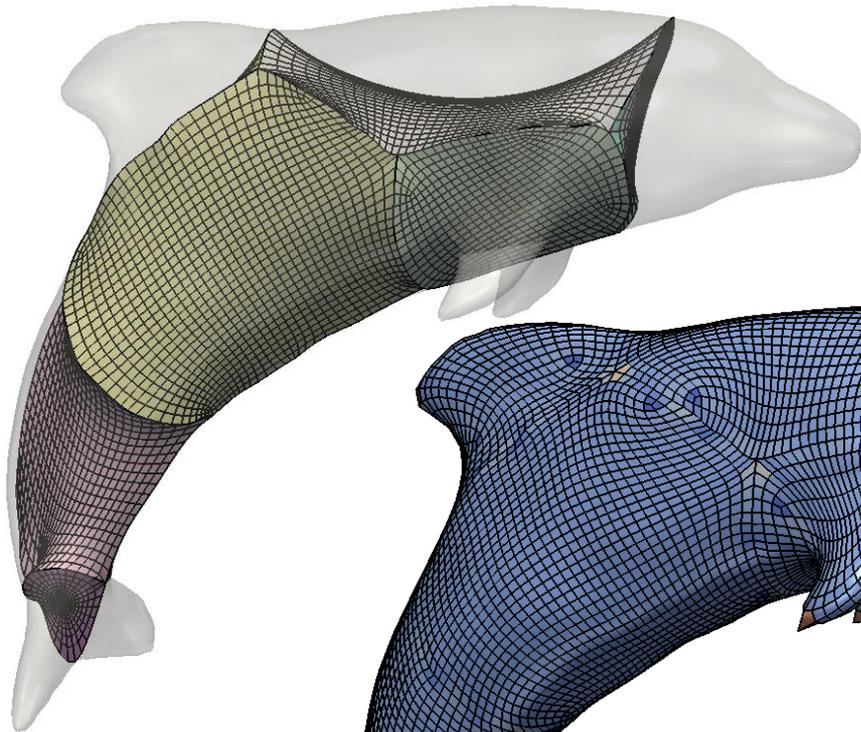


Rovnica riadiaca vývoj

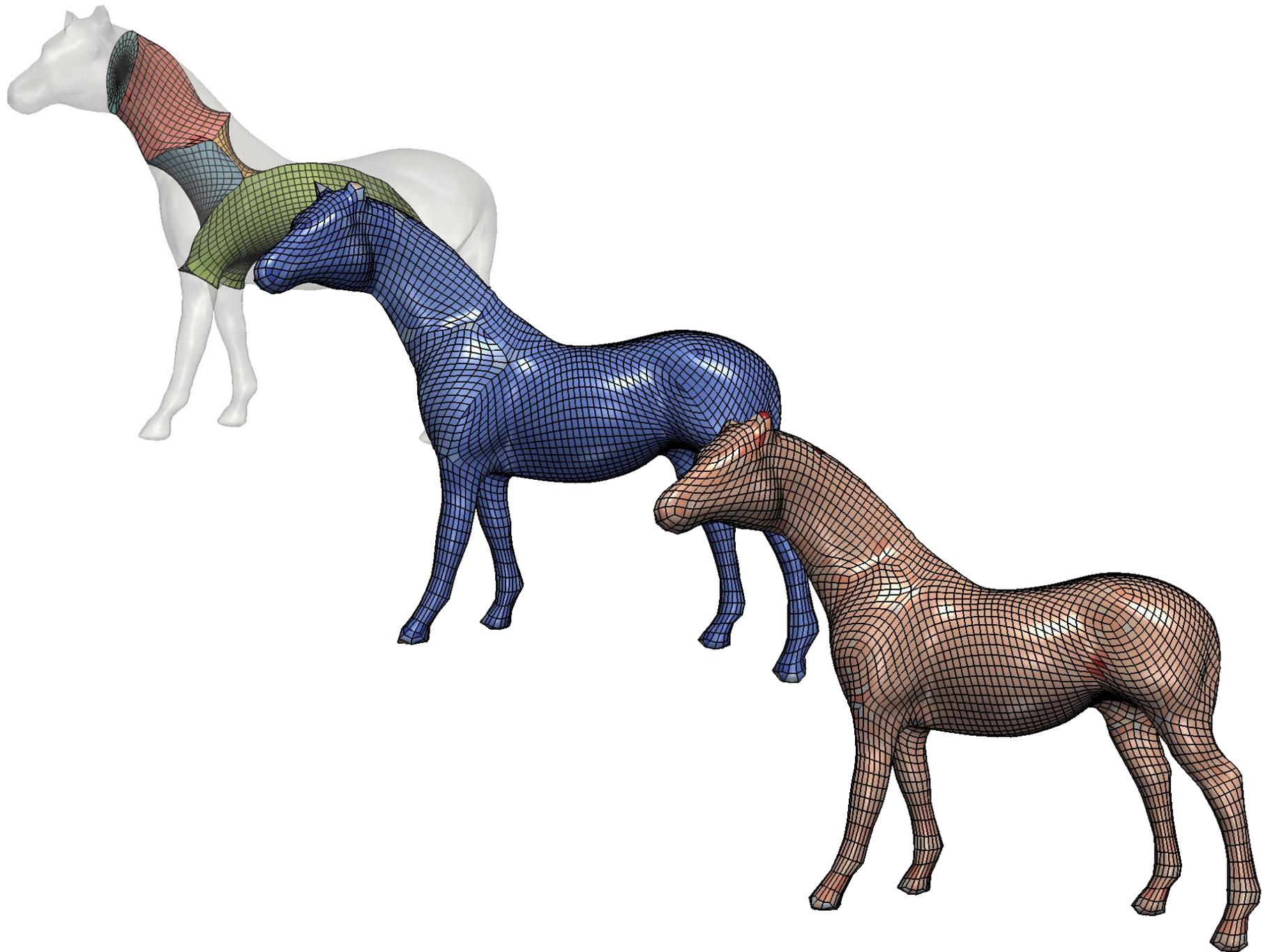
- $\partial_t \mathbf{x} = -d(\mathbf{x})(\nabla d(\mathbf{x}) \cdot \mathbf{N})\mathbf{N} + \mathbf{f}\mathbf{N} - \varepsilon(d(\mathbf{x}))k\mathbf{N} + \mathbf{V}_T$

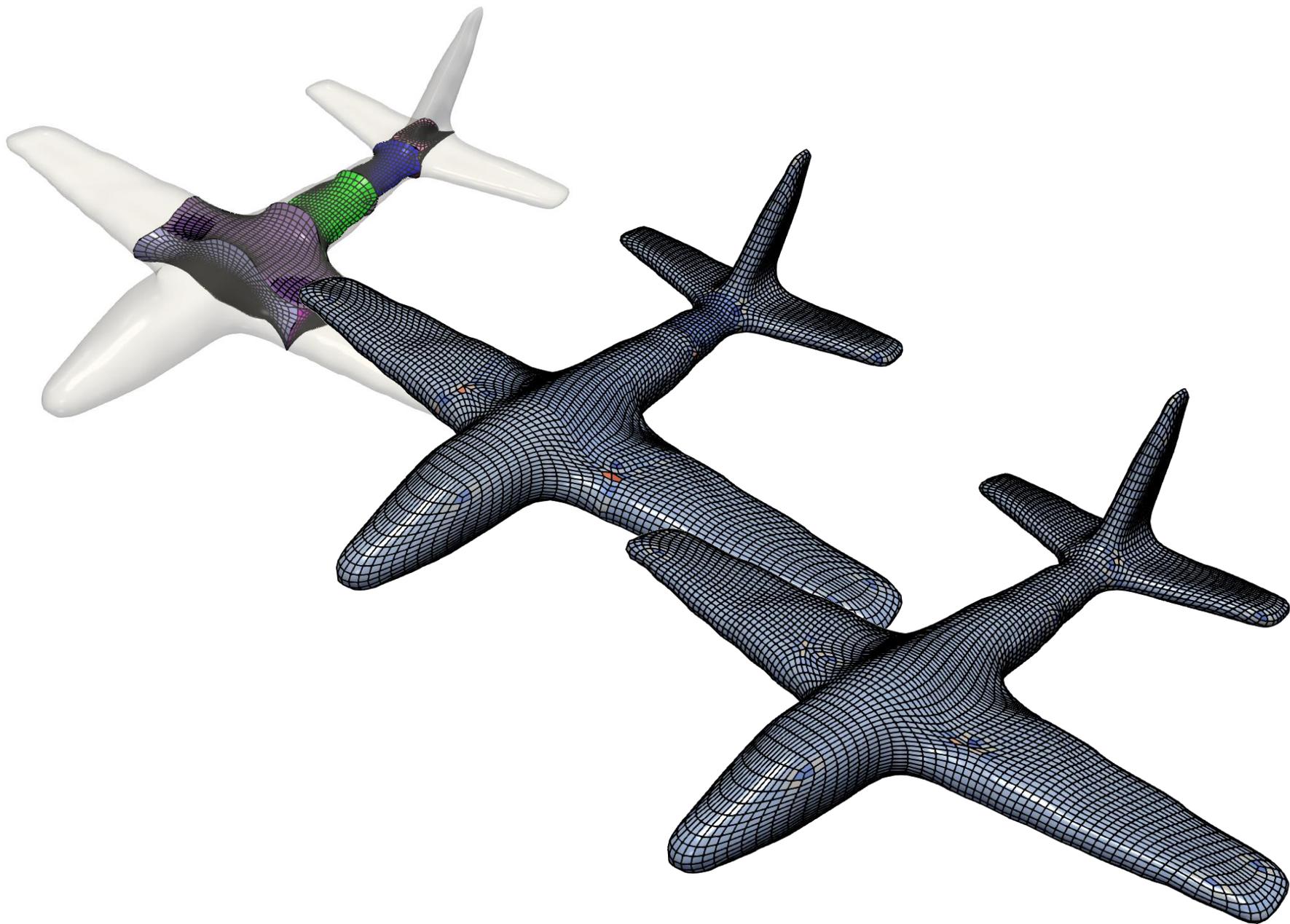


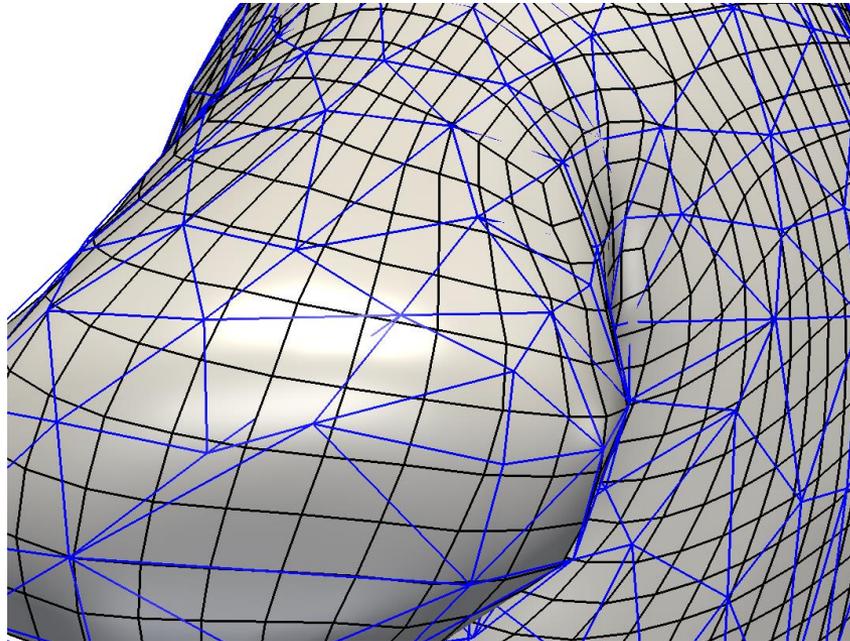
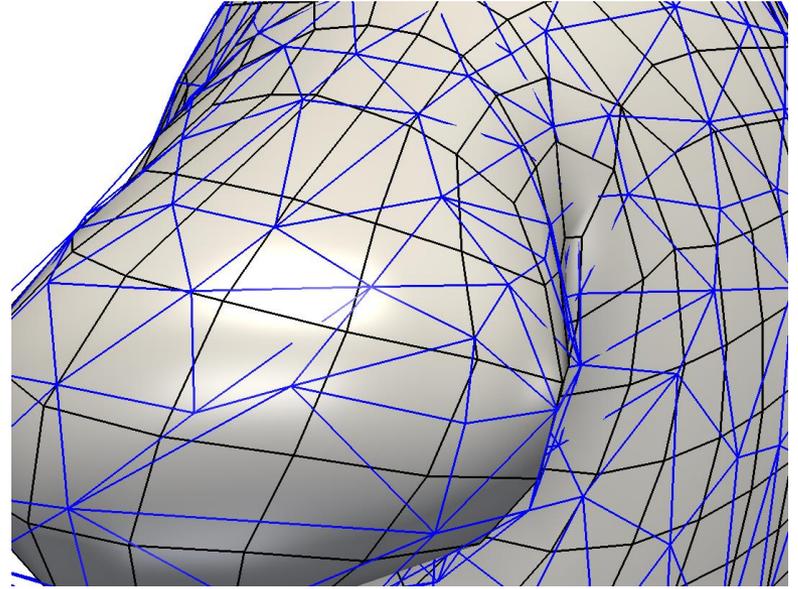
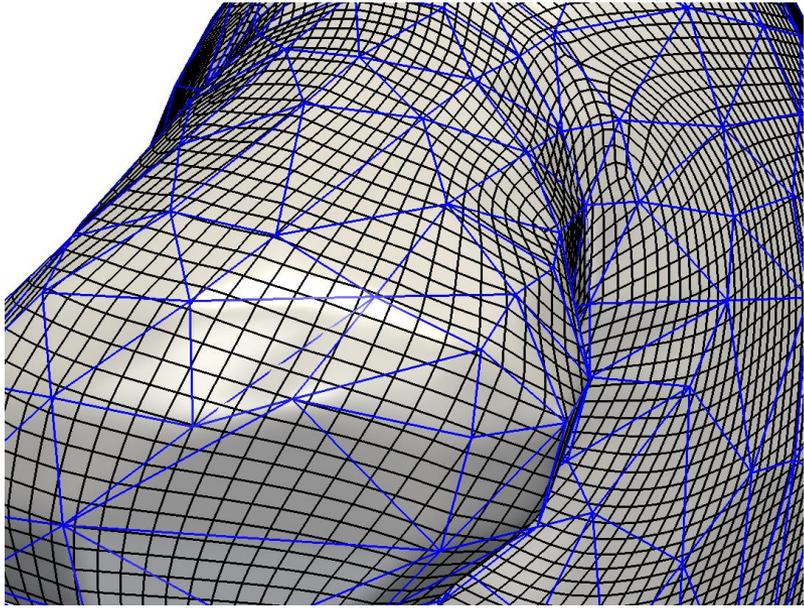




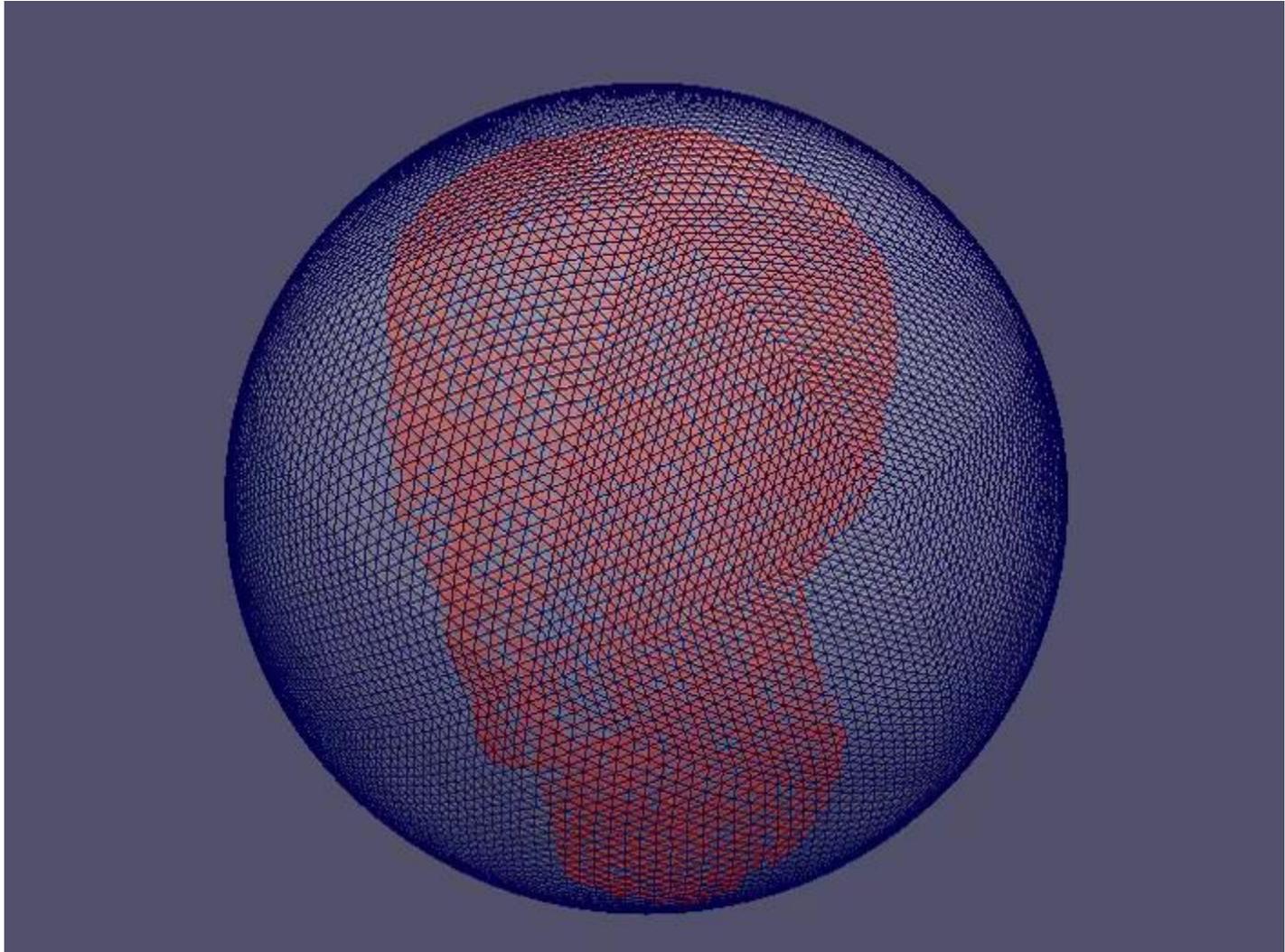


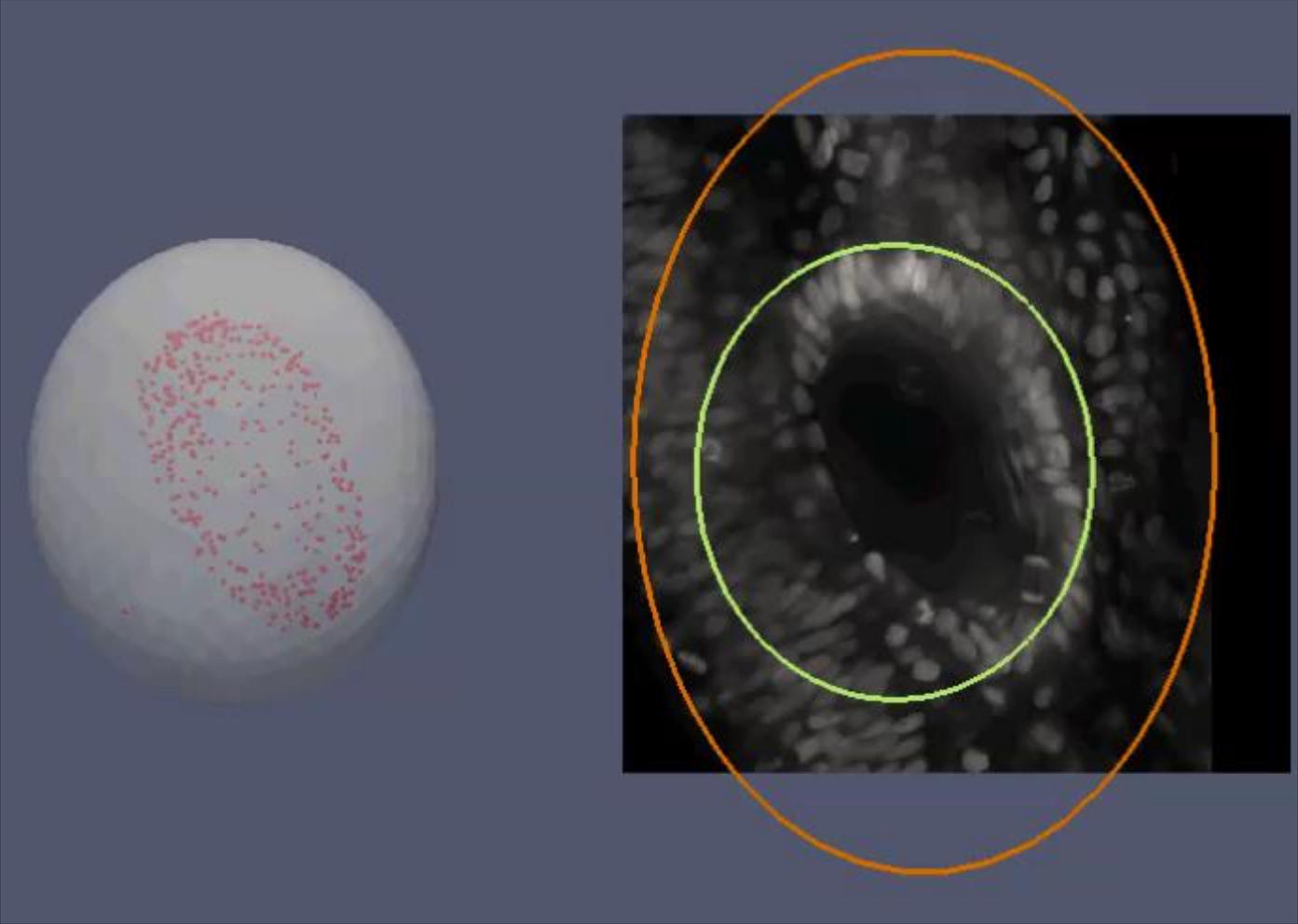












Ďakujem za pozornosť