Systemy CAD/CAE

Zadanie 2.

Mikołaj Wielgos

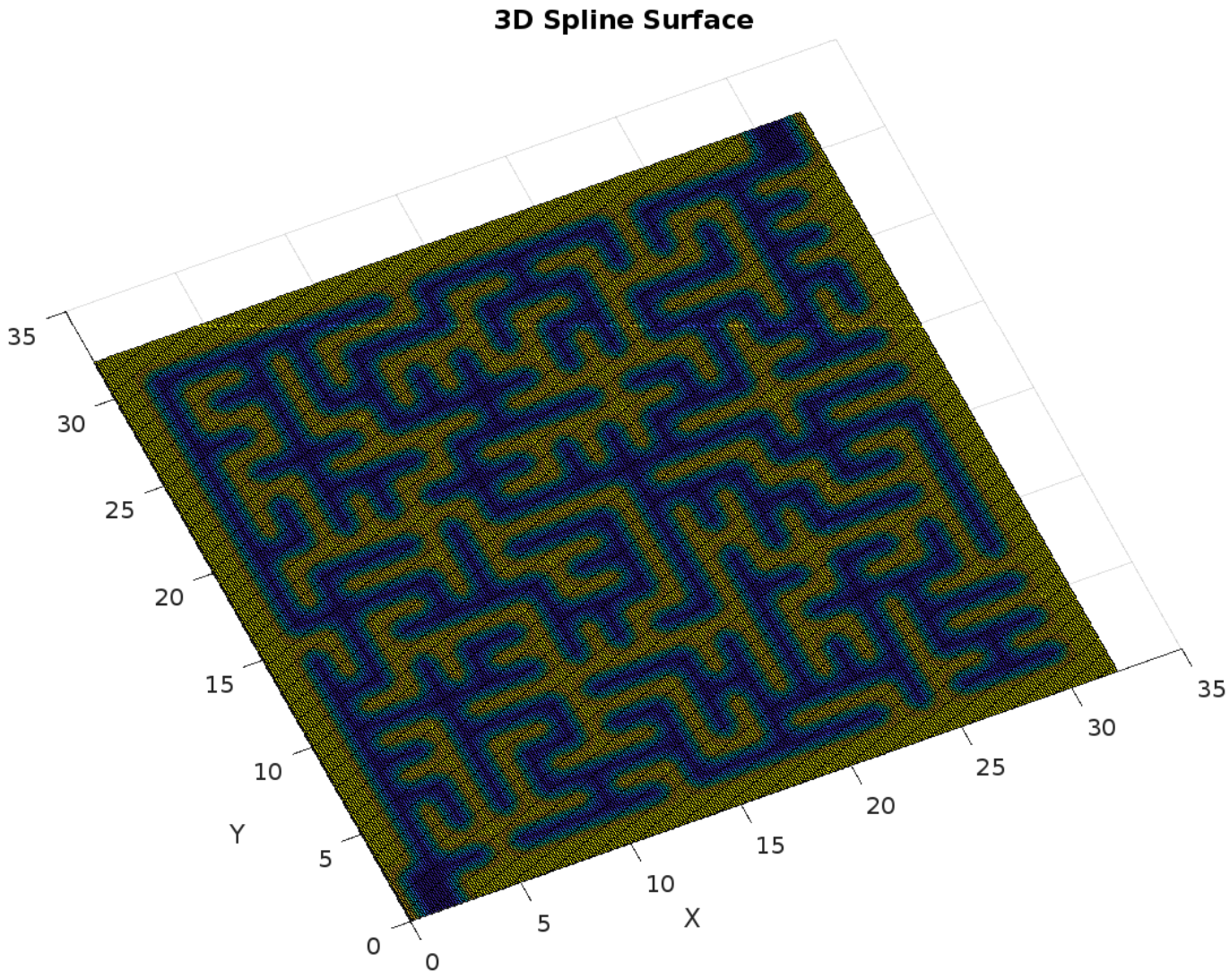
24.10.2023

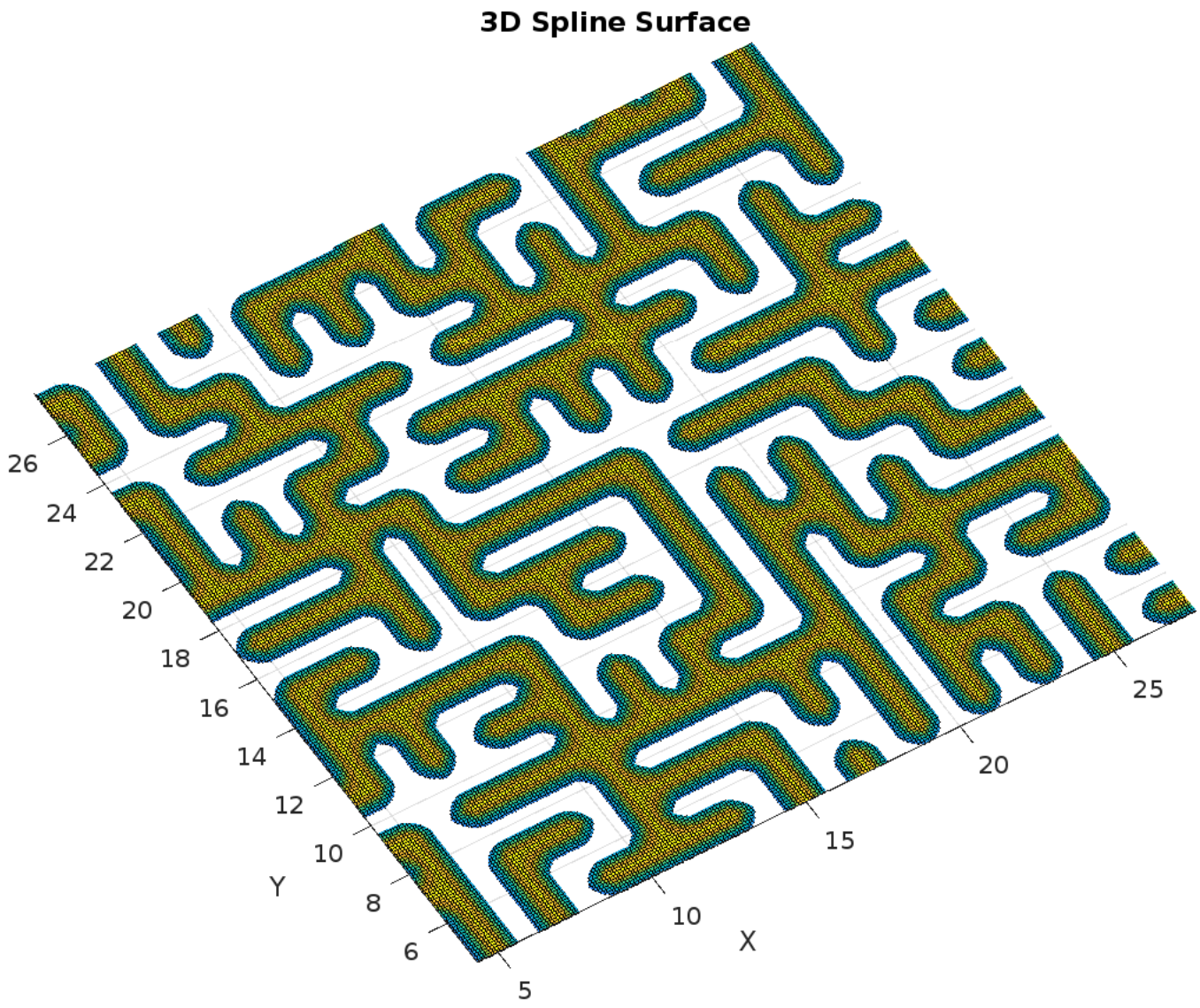
Parametry funkcji

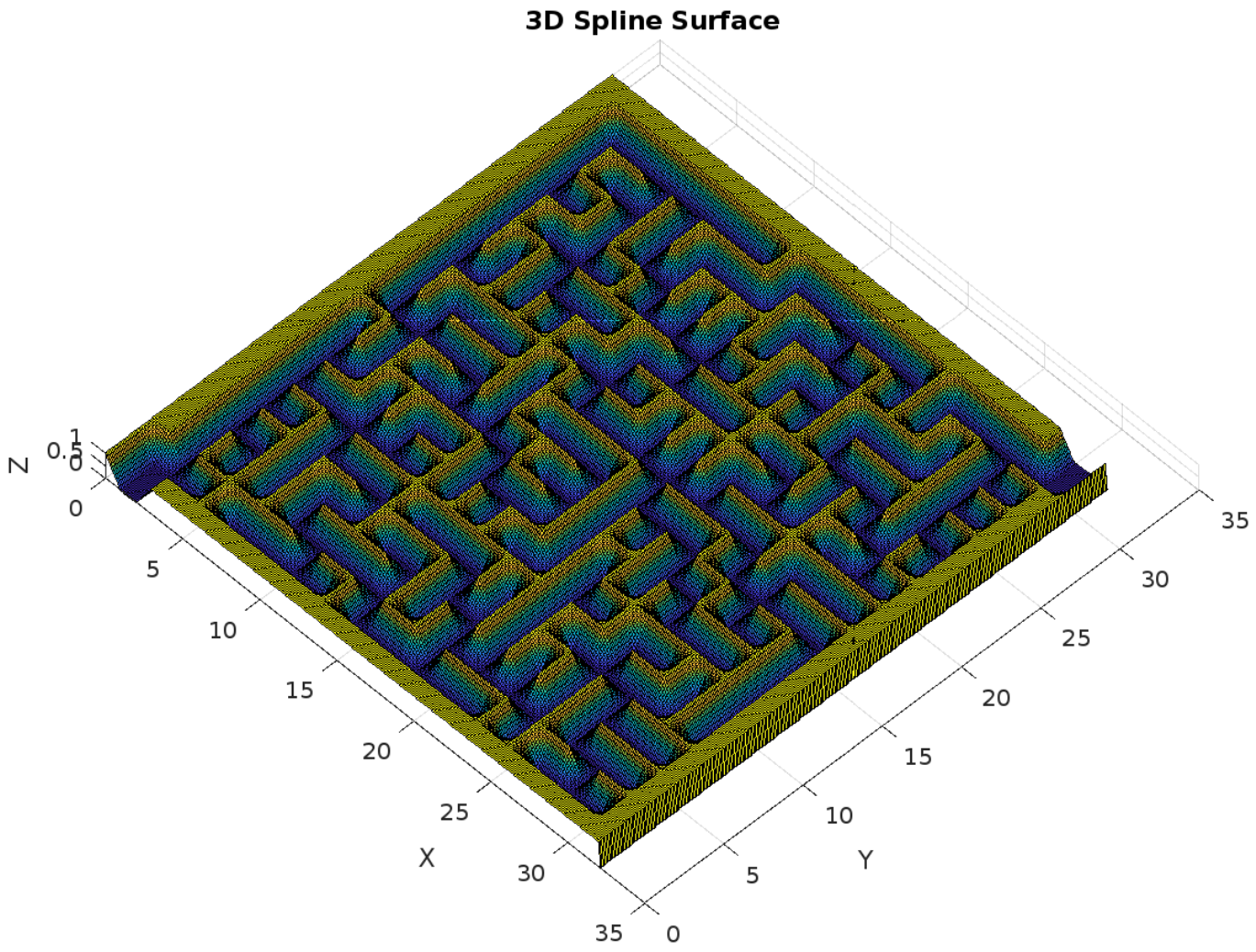
```
knot_vectorx = [0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
28 29 30 31 32 32];

knot_vectory = [0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
28 29 30 31 32 32];

weight_matrix = [
    1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1;
    0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1;
    0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1;
    1 1 0 1 1 1 0 1 0 1 0 1 0 1 1 1 0 1 1 1 0 1 1 1 1 1 0 1 1 1 0 1 1;
    1 1 0 1 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 1 0 0 0 1 0 1 0 1 0 1 0 1 1;
    1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 0 1 0 1 1 1 1 1 0 1 1 1 0 1 0 1 1;
    1 1 0 1 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1 1;
    1 1 0 1 1 1 1 1 1 0 1 0 1 1 1 0 1 0 1 0 1 1 1 1 0 1 0 1 1 1 1 0 1 1;
    1 1 0 1 0 0 0 1 0 1 0 0 0 1 0 0 0 1 0 1 0 0 0 1 0 1 0 0 0 0 0 1 1;
    1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 0 1 1 1 0 1 1 1 0 1 1;
    1 1 0 0 0 1 0 0 0 1 0 1 0 1 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 1 0 1 1;
    1 1 0 1 0 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 0 1 1 1 0 1 1 1 0 1 0 1 1;
    1 1 0 1 0 1 0 1 0 1 0 0 0 0 0 1 0 1 0 0 0 0 0 1 0 0 0 1 0 1 0 1 1;
    1 1 1 1 0 1 0 1 0 1 1 1 0 1 1 1 0 1 0 1 0 1 0 1 0 1 1 1 0 1 1 1 1;
    1 1 0 0 0 0 0 1 0 1 0 0 0 1 0 1 0 1 0 1 0 1 0 0 0 0 0 1 0 0 0 1 1;
    1 1 0 1 1 1 1 1 1 0 1 1 1 0 1 0 1 0 1 0 1 1 1 0 1 0 1 1 1 1 0 1 1;
    1 1 0 1 0 0 0 1 0 1 0 1 0 0 0 1 0 0 0 1 0 1 0 1 0 0 0 0 0 1 0 1 1;
    1 1 0 1 0 1 1 1 1 1 0 1 1 1 1 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 0 1 1;
    1 1 0 1 0 0 0 1 0 1 0 1 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 1 0 0 0 1 1;
    1 1 1 1 0 1 1 1 0 1 1 1 1 1 0 1 1 1 0 1 0 1 1 1 0 1 0 1 1 1 1 1 1;
    1 1 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 1 0 1 0 0 0 1 1 1;
    1 1 1 1 1 1 1 1 0 1 0 1 0 1 1 1 0 1 1 1 1 1 1 1 0 1 0 1 1 1 0 1 1;
    1 1 0 1 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 1 0 1 0 0 0 1 0 0 0 1 0 1 1;
    1 1 0 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 0 1 1;
    1 1 0 0 0 1 0 1 0 0 0 1 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1 1;
    1 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 0 1 1;
    1 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 0 0 1 0 1 0 1 0 0 0;
    1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0;
    1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1;
    ]
```

Zmiany w funkcji wyliczającej

```
% ..Other code

% Compute the coefficient matrix M
for i = 1:nrx
    for j = 1:nry
        spline1 = compute_spline(knot_vectorx, px, i, X) .*
compute_spline(knot_vectory, py, j, Y);
        M = M + weight_matrix(i, j) * spline1;
    end
end

% Other code..
```




3D Spline Surface
26
24
22
20
18
16
14
12
10
8
6
Y
5
10
15
20
25
X


3D Spline Surface
Z
1
0.5
0
0
5
10
15
20
25
30
35
X
0
5
10
15
20
25
30
35
Y