Lab 2

Systemy CAD/CAE

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1. Zmodyfikowany fragment kodu

```
function spline2D_comp()

knot_vectorx  % data;
knot_vectory  % data;

coefficient_vector %data;

precision = 0.01

%macros
compute_nr_basis_functions = @(knot_vector,p) size(knot_vector, 2) -
p - 1
mesh   = @(a,c) [a:precision*(c-a):c]

%splines in x
px = compute_p(knot_vectorx)
tx = check_sanity(knot_vectorx,px)
nrx = compute_nr_basis_functions(knot_vectorx,px)

x_begin = knot_vectorx(1)
x_end = knot_vectorx(size(knot_vectorx,2))

x=mesh(x_begin,x_end);

%splines in y
py = compute_p(knot_vectorx)
ty = check_sanity(knot_vectorx,py)
nry = compute_nr_basis_functions(knot_vectorx,py)

y_begin = knot_vectory(1)
y_end = knot_vectory(size(knot_vectory,2))

y=mesh(y_begin,y_end);

%X and Y coordinates of points over the 2D mesh
[X,Y]=meshgrid(x,y);

M = zeros(length(x), length(y));

for i=1:nrx
  %compute values of
  vx=compute_spline(knot_vectorx,px,i,X);
  for j=1:nry
    vy=compute_spline(knot_vectory,py,j,Y);
    spline = vx .* vy;
```

```
45.
46.     M = M + spline .* coefficient_vector(i, j)
47.   end
48. end
49. surf(X,Y,M);
50.
51. return
```

2. Wektory węzłów oraz współczynników użytych do rysowania labiryntu

knot_vectorx = [0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16];

knot_vectory = [0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16];

coefficient_vector = [

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1;

1 0 0 0 0 0 1 0 0 0 0 0 1 0 0 0 1;

1 0 1 1 1 0 1 0 1 1 1 0 1 1 1 0 1;

1 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 1;

1 0 1 0 1 1 1 1 1 0 1 1 1 0 1 0 1;

1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 1;

1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1;

1 0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 1;

1 1 1 1 1 0 1 0 1 1 1 0 1 1 1 1 1;

1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1;

1 1 1 0 1 1 1 1 1 1 0 1 1 1 0 1 1;

1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 1;

1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1;

1 0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 1;

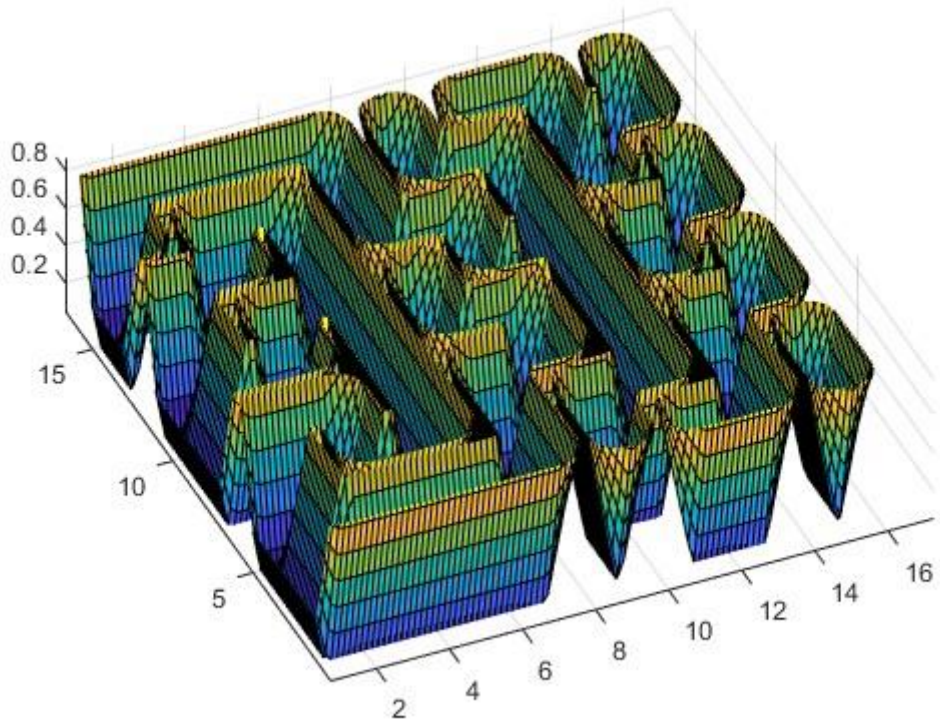
1 1 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1;

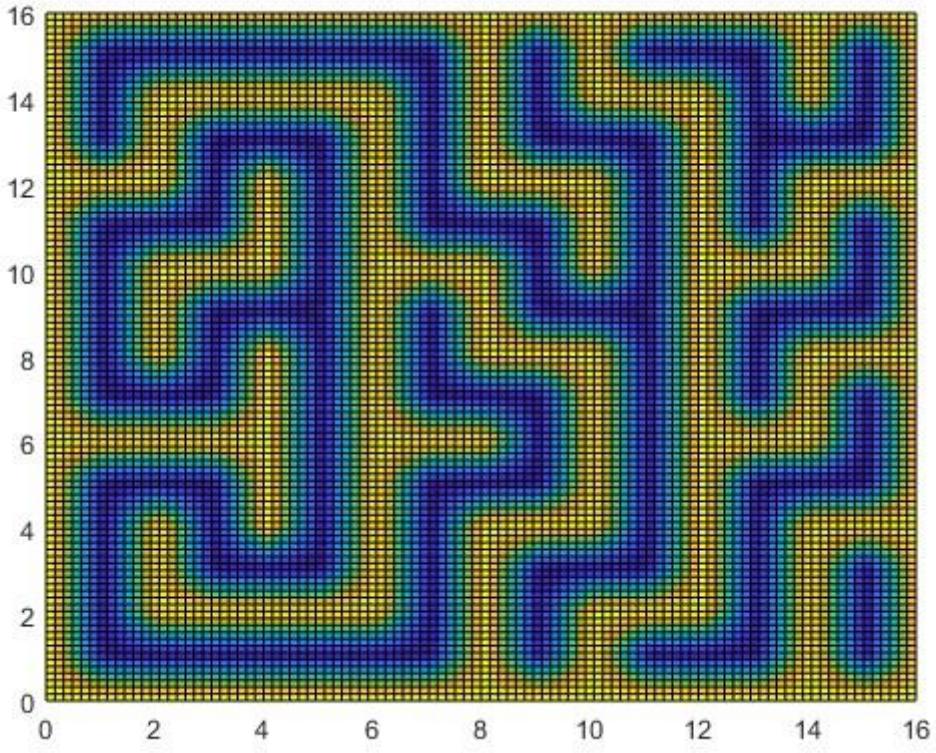
1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1;

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1;

];

3. Wygenerowany labirynt




16
14
12
10
8
6
4
2
0
0
2
4
6
8
10
12
14
16