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Gr. Wtorek 13:00

Systemy CAD/CAD

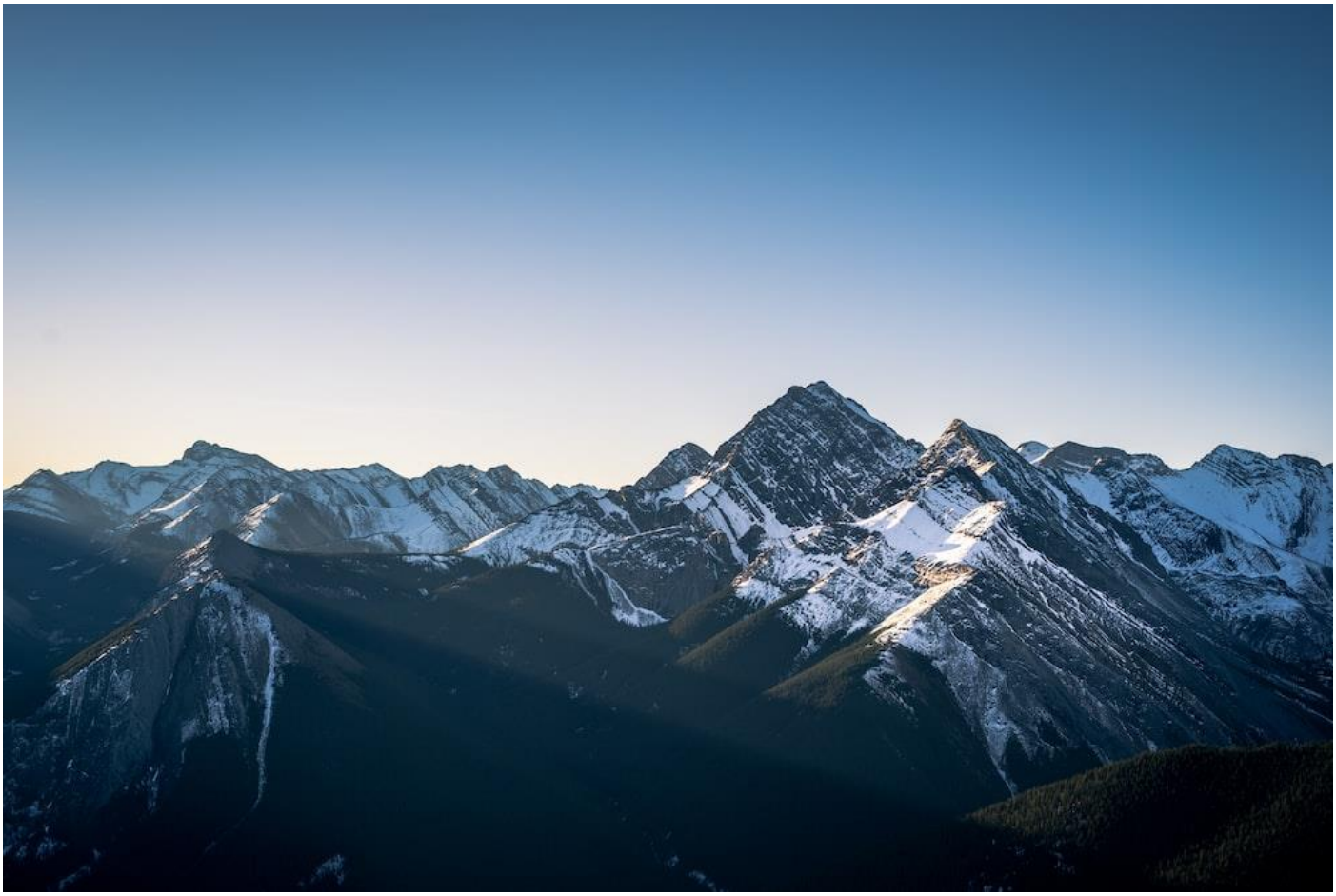
Laboratorium 1

1. Zmodyfikowana funkcja splines_comb

```
function splines_comp(precision,knot_vector,coeffs)

% subroutine calculating number of basis functions
compute_nr_basis_functions = @(knot_vector,p) size(knot_vector, 2) - p - 1;
% subroutine generating mesh for drawing basis functions
mesh = @(a,c) [a:(c-a)/precision:c];
% subroutine drawing basis functions
plot_spline = @(knot_vector,p,nr,x) plot(x,compute_splines(knot_vector,p,nr,x));

% computing order of polynomials
p = compute_p(knot_vector);
% validation of knot vector construction
t = check_sanity(knot_vector,p);
% if knot vector is poorly constructed - stop further processing
if (~t)
  disp("Poorly constructed knot_vector")
  return
end
% computating number of basis functions
nr = compute_nr_basis_functions(knot_vector,p);

% beginning of drawing range
x_begin = knot_vector(1);
% end of drawing range
x_end = knot_vector(size(knot_vector,2));
x=mesh(x_begin,x_end);

z=zeros(1,precision+1);
add_splines(knot_vector,p,nr,x,z,coeffs(1));
for i=1:nr
  z=add_splines(knot_vector,p,i,x,z,coeffs(i));
end


img = imread('obraz.jfif');
image('CData',img,'XData',[1 51],'YData',[1 0])
hold on
plot(x,z,'r');
axis([1 51 0 1])
hold off
```

```
function y=add_splines(knot_vector,p,nr,x,z,coeff)

ybuff=coeff*compute_spline(knot_vector,p,nr,x);
y=ybuff+z;
return
end
```

2. Wybrane zdjęcie Skyline



3. Argumenty wywołania

splines_comp(10000,
[1, 1, 1, 2, 2, 3, 3, 4, 4, 5, 5, 6, 6, 7, 7, 8, 8, 9, 9, 10, 10, 11, 11, 12, 12, 13, 13, 14, 14, 15, 15, 16, 16, 17, 17, 18, 18, 19, 19, 20, 20, 21, 21, 22, 22, 23, 23, 24, 24, 25, 25, 26, 26, 27, 27, 28, 28, 29, 29, 30, 30, 31, 31, 32, 32, 33, 33, 34, 34, 35, 35, 36, 36, 37, 37, 38, 38, 39, 39, 40, 40, 41, 41, 42, 42, 43, 43, 44, 44, 45, 45, 46, 46, 47, 47, 48, 48, 49, 49, 50, 50, 51, 51, 51],
[0.439, 0.453, 0.461, 0.469, 0.463, 0.464, 0.461, 0.468, 0.48, 0.476, 0.472, 0.472, 0.472, 0.479, 0.495, 0.503, 0.5, 0.493, 0.488, 0.485, 0.479, 0.469, 0.469, 0.468, 0.471, 0.469, 0.469, 0.472, 0.477, 0.469, 0.461, 0.46, 0.466, 0.474, 0.474, 0.474, 0.464,

0.472, 0.472, 0.46, 0.457, 0.447, 0.449, 0.452, 0.452, 0.444, 0.444, 0.45, 0.458, 0.471, 0.49, 0.5, 0.5, 0.488, 0.501, 0.512, 0.527, 0.544, 0.552, 0.565, 0.568, 0.576, 0.57, 0.557, 0.549, 0.536, 0.527, 0.511, 0.503, 0.498, 0.503, 0.519, 0.527, 0.517, 0.512, 0.506, 0.49, 0.501, 0.5, 0.496, 0.504, 0.498, 0.495, 0.496, 0.493, 0.487, 0.487, 0.484, 0.468, 0.471, 0.482, 0.496, 0.5, 0.493, 0.488, 0.482, 0.485, 0.487, 0.484, 0.479, 0.476])

4. Wynik