

```

1  function [profile] = get3D(D,Threshold,ps,alpha,a,b)
2      % 'get 3D' functiof for the LEGO Eisenbahn
3
4      dim = size(D);          % dim = [y,x,?,#images]
5      poi = zeros(dim(4),dim(1));
6      profile = zeros(size(poi));
7      x = 1:1:dim(1);
8      y = 1:1:dim(2);
9      ref_plane = a + b*x;
10
11     for l = 1:dim(4)
12         % img = imrotate(D(:,:,1,l),theta,'crop');
13
14         img = imrotate(D(:,:,1,l),-90);
15         img = double(img);
16
17         for j = 1:dim(1)
18             cm = NaN;
19             if max(img(:,j))>= Threshold
20                 for k=1:dim(2)
21                     if img(k,j)<Threshold
22                         img(k,j)=0;
23                     end
24                 end
25                 mr = sum(y'.*img(:,j));
26                 M  = sum(img(:,j));
27                 cm = mr/M;
28             end
29             poi(l,j) = cm;
30         end
31     end
32
33     for k = 1:1:size(poi,1)
34         profile(k,:)=-ps*((poi(k,:)-ref_plane)/sin(alpha*pi/180))
35         ;
36     end
37 end
38

```