## 1. Project - Cloud coffee table.

Material: 9 mm plywood, covered with white plastic

Technique: CNC milling machine (Digima)

Time: 15 - 21 May 2013

Place: Aalto FabLab, Helsinki

Object: plywood coffee table, consists of three parts: two legs with joints and a surface with 4 holes to insert legs.

Process:

1. Sketching

2. Materials. Firstly I wanted to use 2.8 cm solid wood, but then I sticked to 9 mm plywood due to the absence of wood.

3. Thinking about construction and joints - how to merge all three parts together (two legs and a surface).

4. First prototypes - from paper and 3 mm mdf. Firstly I used Adobe Illustrator, but it's not pre-sized, so I started to use DraftSight which is an analogue of AutoCAD. The main parameter I should have keep in mind was 3mm - thickness of mdf material. For all the experiments and in a case of change of material it's important to remember to change a design according to this parameter.

5. Creating design in a real size in DraftSight.

6. First milling attempt. It was a mistake in design, so the attempt was unsuccessful. Also the parts of the table were moving, so we decided to create cuts on each side in order to decrease moving. Because of the features of the milling bit, the angles inside of the holes on a table's surface were rounded, so we added in Rhino 4 round shapes - one for each corner. It changed a look of the surface a bit, but this is a feature of CNC milling machine.

7. After adding cuts and round shapes we made a second attempt. We milled holes in the same surface, and used new piece of plywood for legs. But it was a mistake again - the additional vector paths for cuts were a bit disconnected, to the there was no straight line.

8. We took into consideration all previous mistakes and made a third (last) attempt. Now it was almost perfect. But still some manual adjustments were needed. Somehow the depth of one of the holes for legs joint was 3 mm smaller. So I used a saw to make a hole deeper. Also I used a saw to remove cuts from all sides of the legs. Then I joined 4 joints (2 on each leg) with 4 holes in a surface. The table was ready!

Notes: because of quite thin plywood the construction is not very steady - the square of legs staying on the floor is too small. So it will be good to try the same construction with about 3 cm solid wood.

But the table is able to hold few coffees and a laptop.

The shape of the legs was changed a bit during the process due to a difficulties with joints for such a thin material.