

Report of International Internship Program

Mechanical Engineering Department
Kasetsart University in Thailand

Physics Engineering in Mie University

1st grade of master course

Keisuke Murata

1. Reason

I had stayed in Thailand for a month. And I studied and worked at Mechanical Engineering Department, Kasetsart University.

I participated in this program because I want to experience the real work environment in foreign country. And I want to experience foreign culture.

2. Kasetsart University

Kasetsart University was founded in 1943, and it is the third oldest university in Thailand. Agriculture is encouraged in this university because this university is the first agricultural university in Thailand. But, there are a lot of faculties in this university now. There are some governments around this university. So, this university is the industrial center of Thailand.

Kasetsart University is located in Bangkok Thailand. There are some markets around this university. My accommodation is located in this university. There are many shops in this university. For example, restaurant, massage shop or market. So, it is so convenient for me to live in my accommodation.

3. Schedule

Sep 5	Arriving at KU and introduction to KU campus
Sep 6	Orientation of my internship program and Factory tour to RDIPT, Automotive Lab
Sep 9 – Sep 13	Practical Training at Calibration Lab
Sep 16 – Sep 18	The same as above
Sep 19 – Sep 20	Practical Training at Mechanical Engineering department
Sep 23 – Sep 27	The same as above
Sep 28 – Oct 1	Preparing personal report
Oct 2	Departure for Nagoya

4. Calibration

I had studied and worked at the dimensional calibration lab. I learned how to measure some surfaces. For example, some metals.

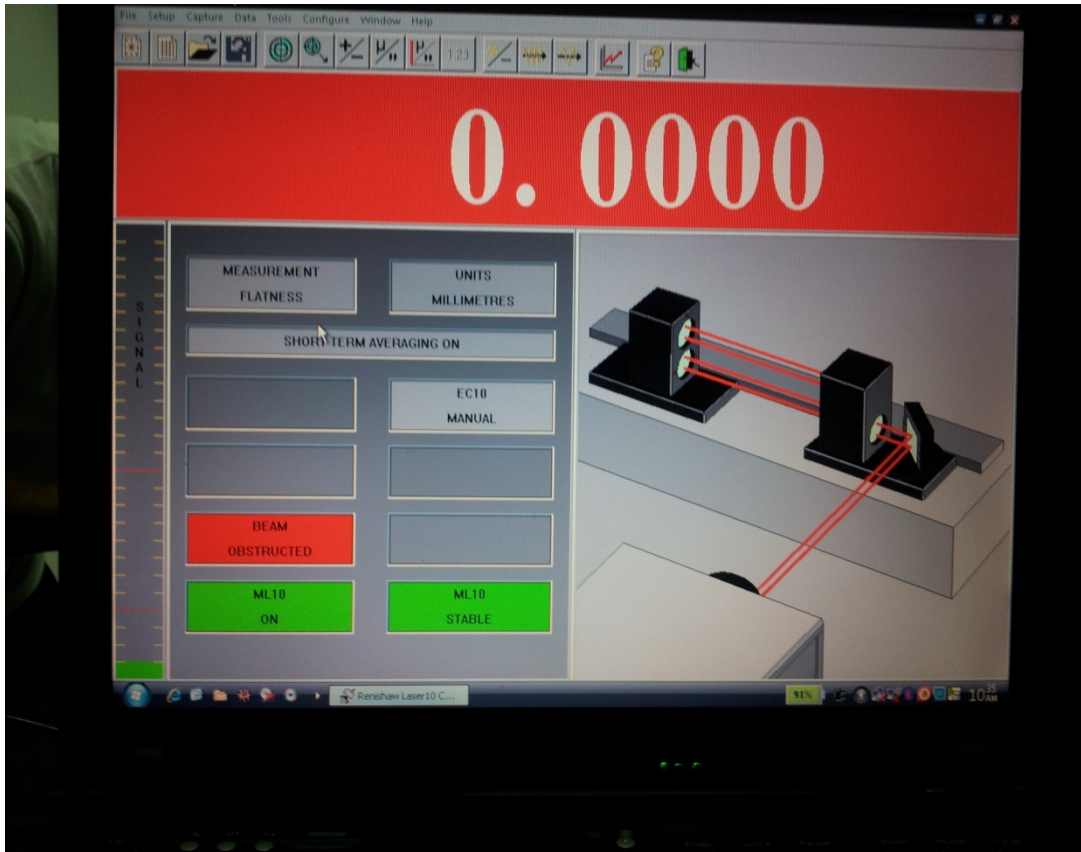
At first sight, surface of some metals seems flat. But, it's not flat. We need to grasp its condition when we make something from it. So, it is important for us to measure surfaces. I was told that “the measurement is base for everything” by my teacher.

I learned how to measure some surfaces by using laser. Actually, I measured a surface of a measuring instrument in the lab.

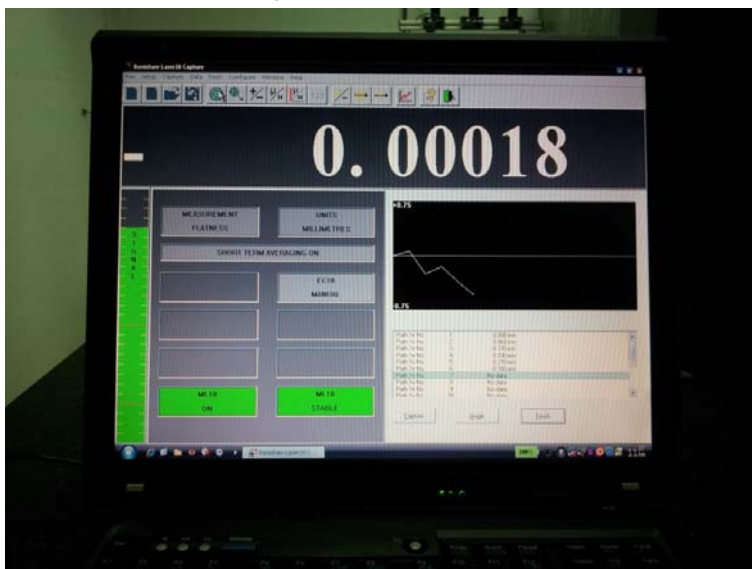
- ① We set two mirrors both end of line of surface which we want to measure.



- ② The laser hit a mirror. It which reflected by this mirror hit another mirror.
- ③ The laser which emitted by the laser machine reflects and comes back to the laser machine.

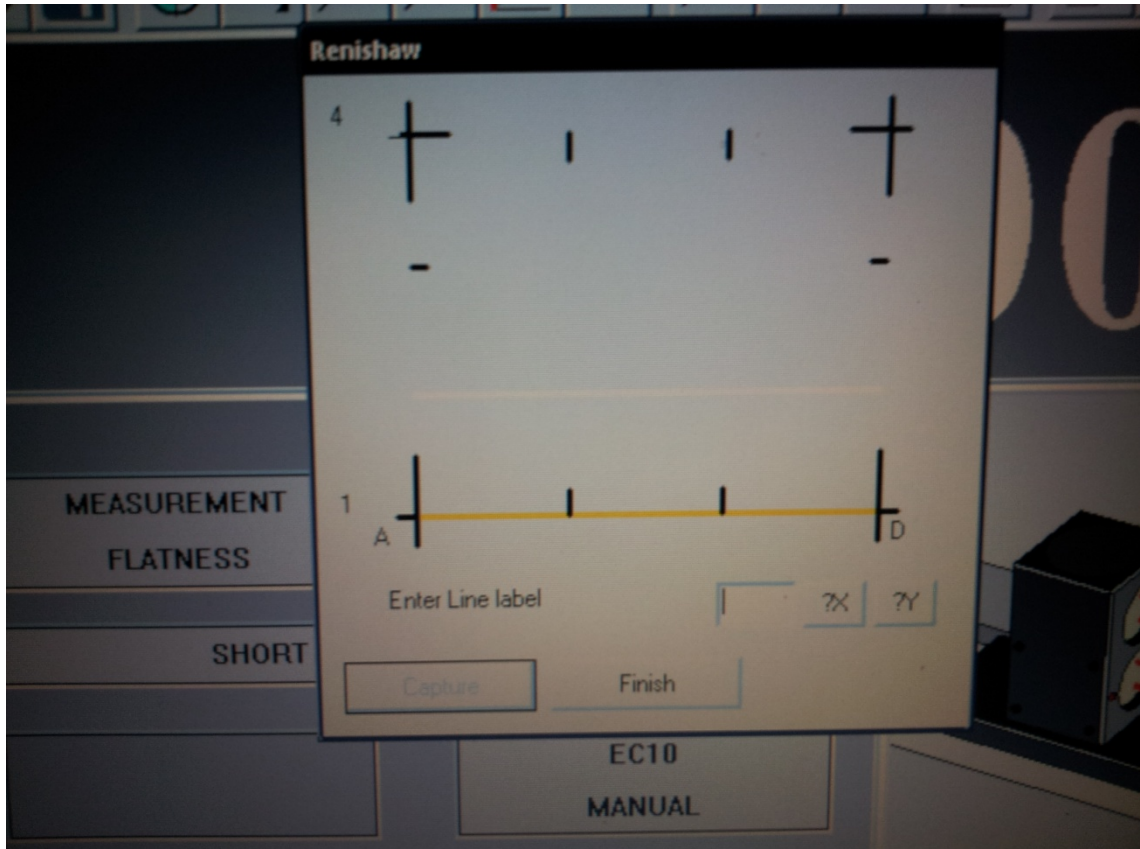


- ④ On PC, we can calculate the optical path length or surface by laser's wave length, the inflection rate or the reflection rate.



⑤ We try to do same things ① to ④ on the others lines of surface.

This picture means that we finish measuring line 1(A to D). Next we should measure line 2(A to D), line 3 and line 4.



I described actual measured value and result below.

RENISHAW CALIBRATION INTERFEROMETER SYSTEM
PRINT GRID NUMERIC DATA

Machine:saface plat Serial No:001
Date:10:54 Sep 16 2013 By:mongkol
Misc:800x600x200 mm Location:rdipt
TITLE:cal Filename: CAPTURED DATA.RIN

Units of data values are micrometres

Footsize = 50.0 mm
Grid X dimension = 800.000 mm
Grid Y dimension = 600.000 mm

Reference Point 1 - 0.000 at position 1A
Reference Point 2 - 0.000 at position 4A
Reference Point 3 - 0.000 at position 1D
Reference Point 4 - 0.000 at position 4D

Line D :

1) 3.739	2) 4.258	3) 4.637	4) 4.876
5) 4.985	6) 5.094	7) 5.583	8) 5.552
9) 5.591	10) 5.730	11) 5.979	12) 7.058
13) 5.617			

Line C :

1) 5.608	2) 6.212	3) 6.266	4) 6.160
5) 6.394	6) 4.968	7) 5.082	8) 5.426
9) 7.220	10) 6.844	11) 6.788	12) 6.812
13) 6.496			

Line B :

1) 5.304	2) 4.191	3) 4.247	4) 4.324
5) 4.461	6) 4.108	7) 5.354	8) 4.201
9) 4.008	10) 3.855	11) 4.072	12) 4.018
13) 3.835			

Line A :

1) 3.786	2) 5.633	3) 5.899	4) 6.316
5) 6.752	6) 6.989	7) 7.285	8) 7.322
9) 7.278	10) 8.825	11) 5.901	12) 5.758
13) 5.664			

Line 4 :

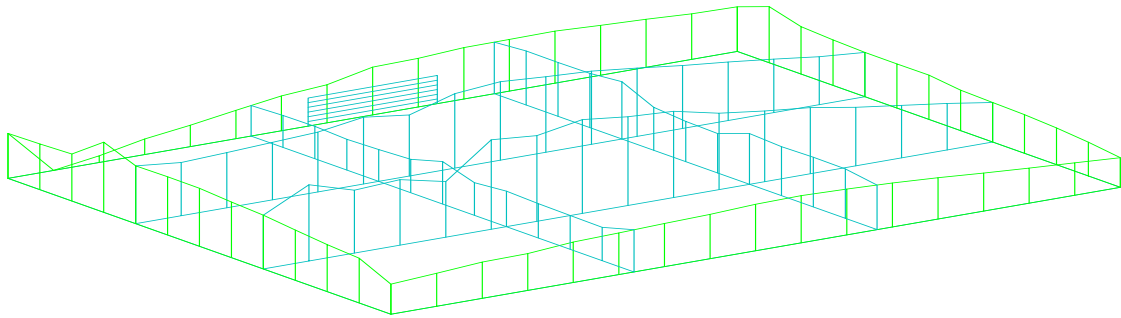
1) 5.664	2) 0.000	3) 0.836	4) 1.962
5) 2.697	6) 3.563	7) 4.379	8) 4.805
9) 6.020	10) 6.126	11) 6.472	12) 6.508
13) 6.554	14) 6.269	15) 6.035	16) 5.741
17) 5.617			

Line 3 :

1) 7.278	2) 6.698	3) 6.937	4) 7.247
5) 7.526	6) 8.396	7) 7.685	8) 9.365
9) 9.865	10) 9.494	11) 9.214	12) 8.603
13) 7.923	14) 7.362	15) 6.722	16) 6.031
17) 5.591			

Line 2 :

1) 6.752	2) 9.581	3) 7.900	4) 8.239
5) 7.008	6) 11.267	7) 10.796	8) 11.805
9) 11.174	10) 10.862	11) 9.611	12) 8.890

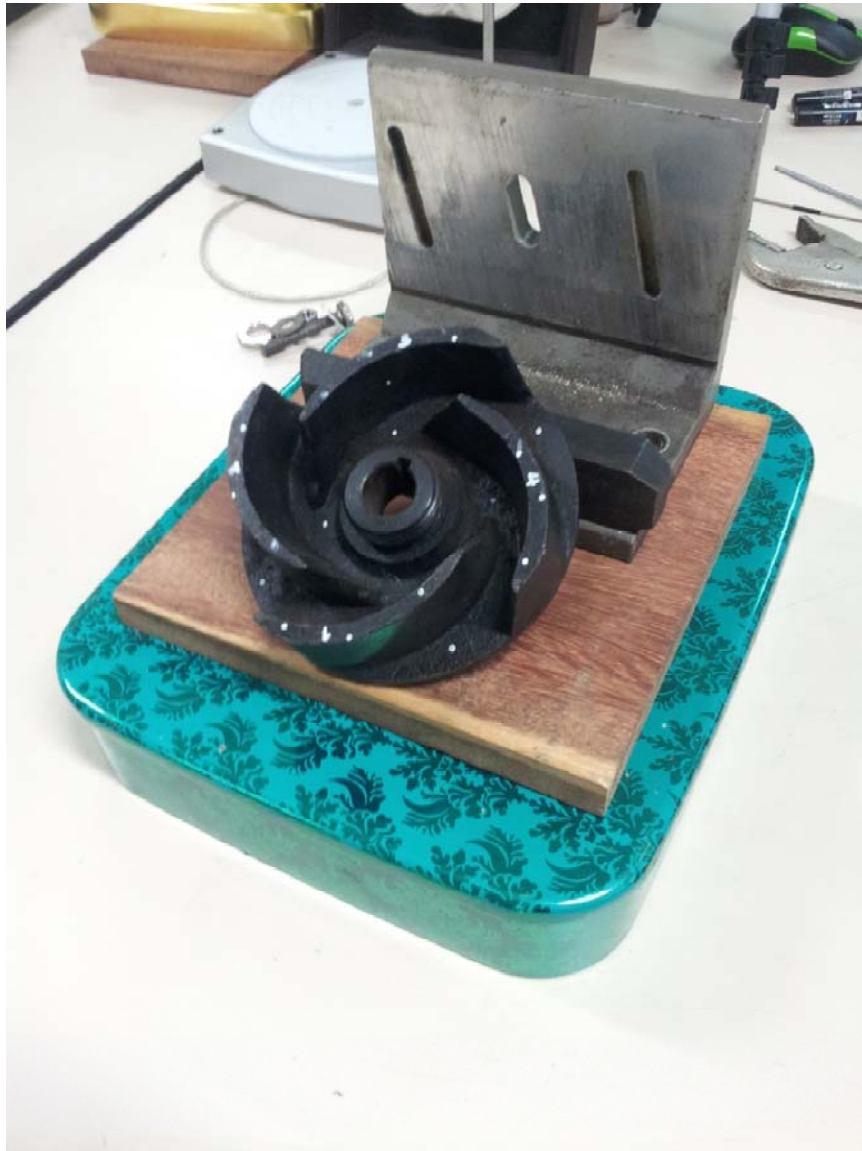


Grid plot

Machine:saface plat	Misc:800x600x200 mm	Cl. error: 6.649
Serial No:001	Location:rddipt	Range: 11.805
Date:10:54 Sep 16 2013		Units: micrometres
By: mongkol		

5.3D Scan/3D CAD

I had studied and worked at the Mechanical Engineering Department. Mainly, I had learned how to use 3D scanner. Actually, I tried to make drafting of an impeller. This is the picture of an impeller.



First, I will explain the 3Dscanner's feature.

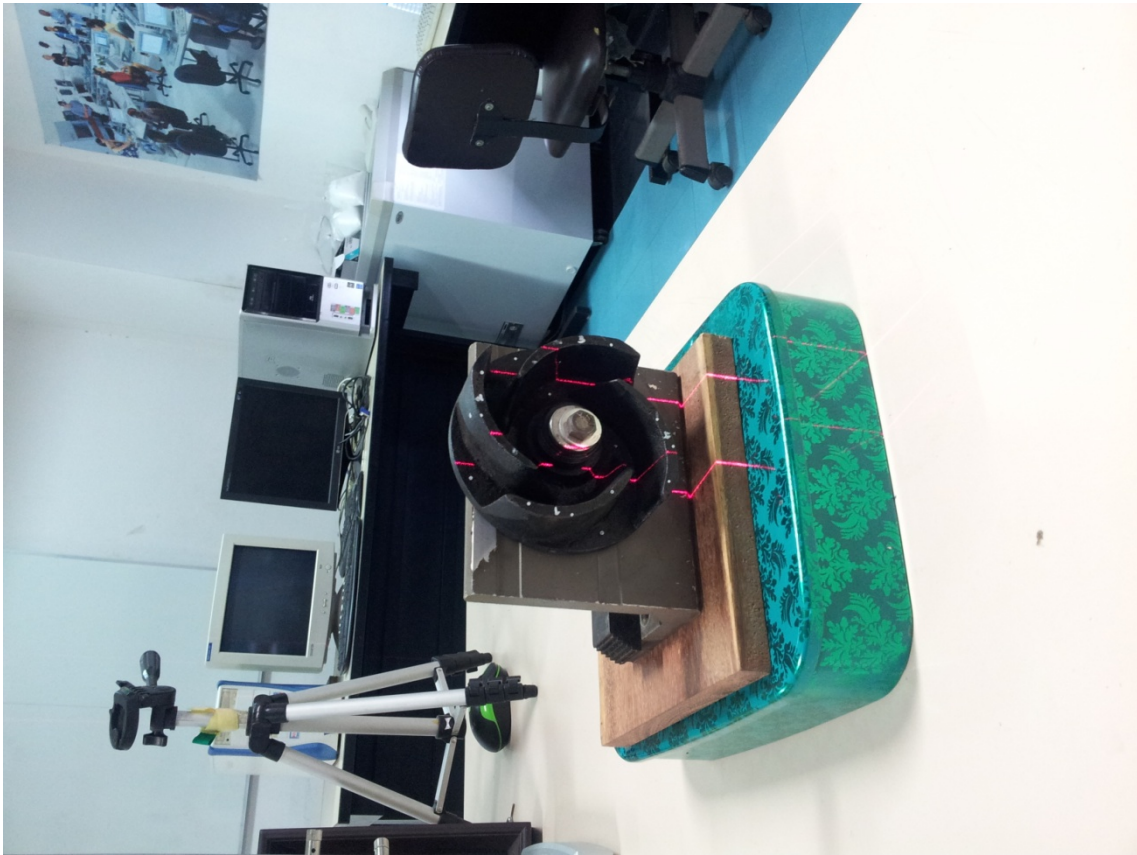
We put something which we want to read by scanner on the turntable. We have the laser which is emitted from 3Dscanner hitting it. The laser hits it around. The 3Dscanner read data every time a turntable turns a little.

This is the picture of the scanner.



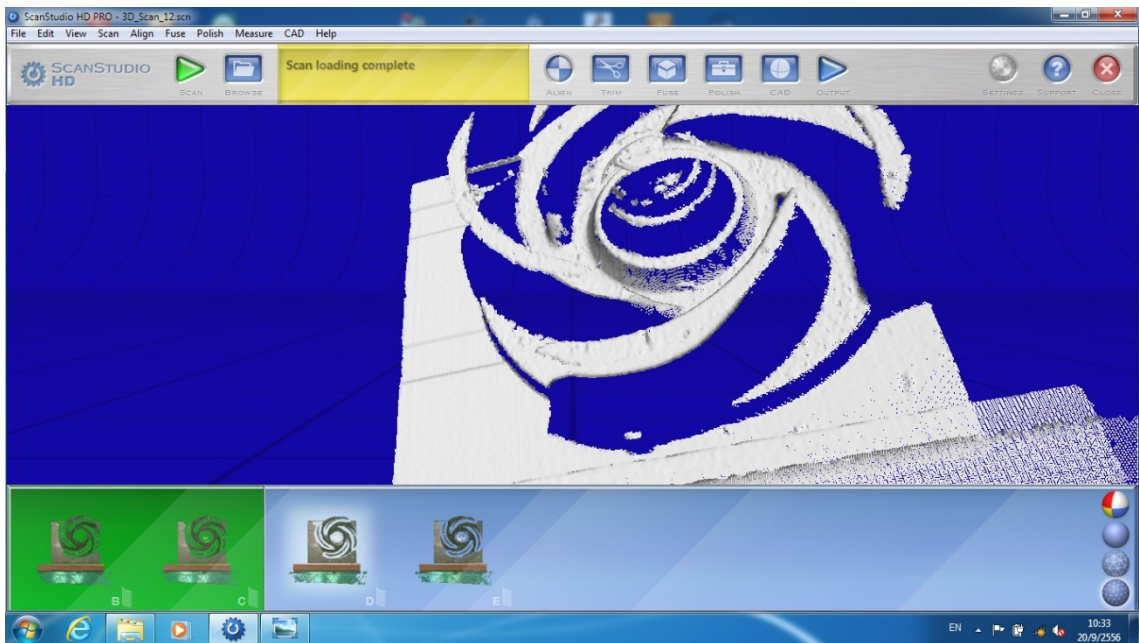
The data are compounded on PC. So, scanning takes about 1 hour. But, I couldn't use the 3D scanner after the test scan because turntable was broken. So, I used 2D scanner. It read the data from some surfaces in many times. And the data were compounded and I handled it on 3DCAD.

This is the picture of the scanned impeller.

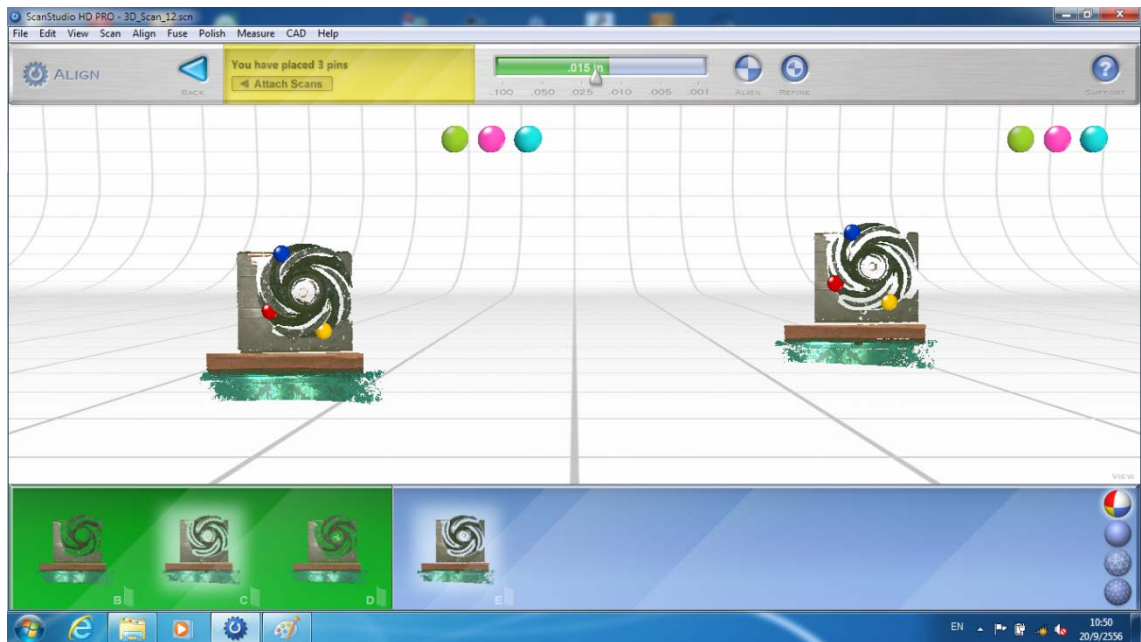


I showed how to modify it approximately.

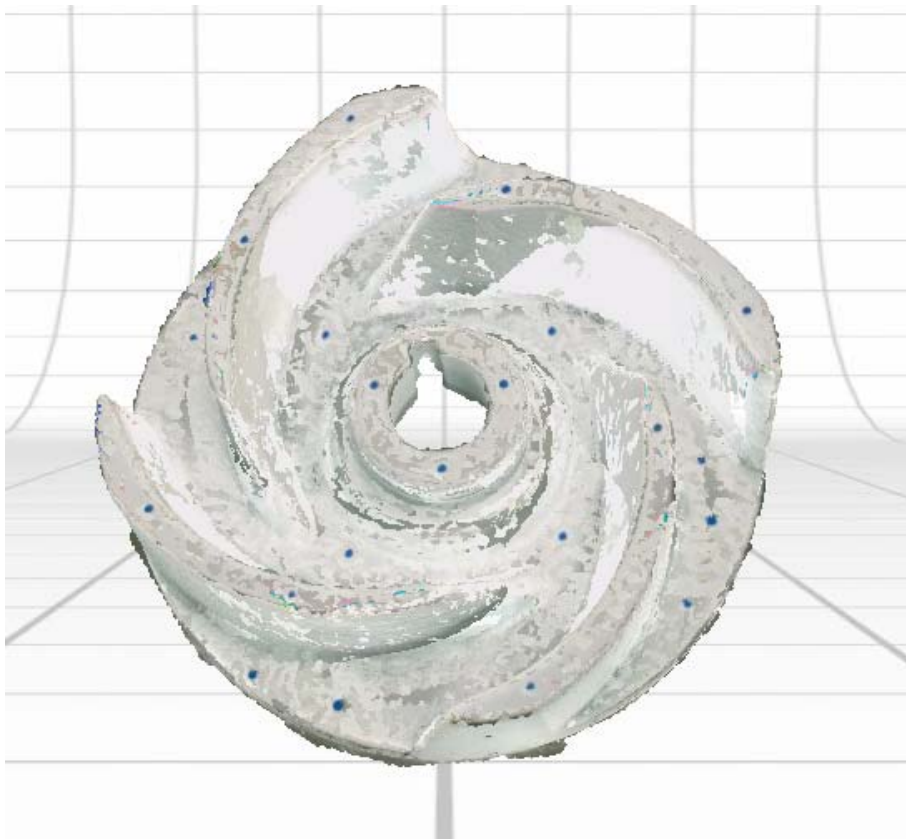
- ① The scanner is linked with PC, and the application whose name is “Scan Studio HD PRO” reads data.



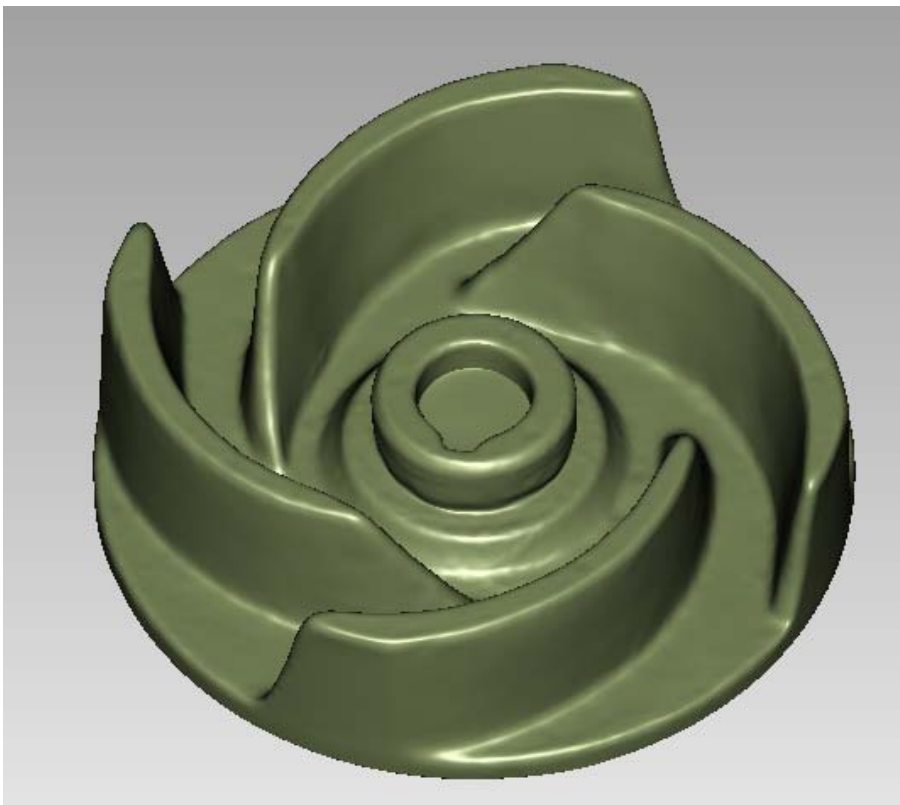
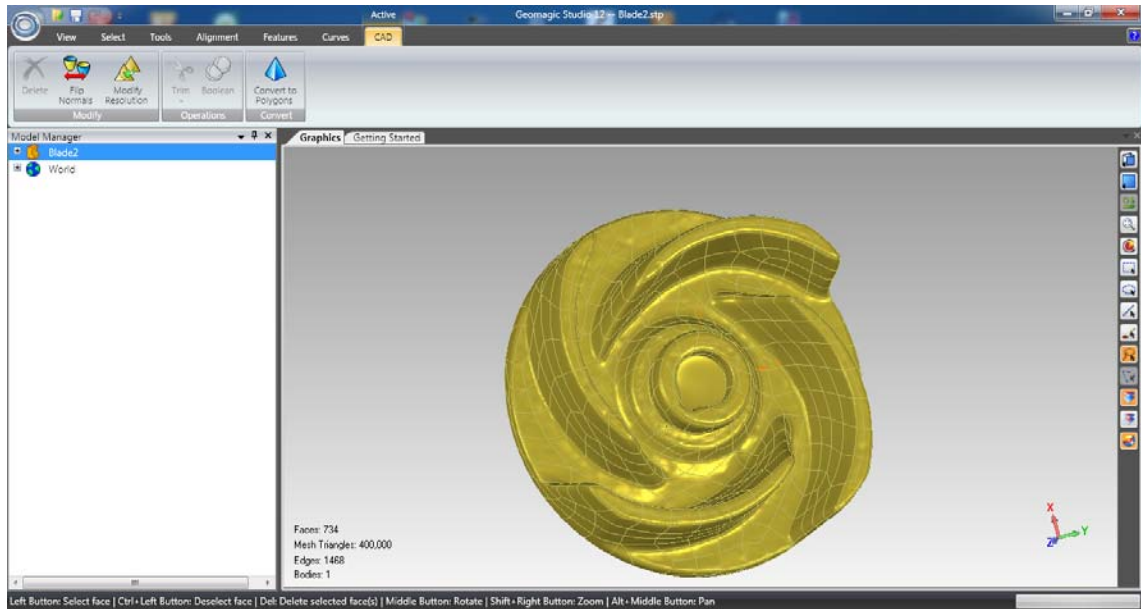
- ② We point three dots which is common point on all data. And the data is compounded.



We can get a 3D data. And, we have to trim some parts which are not an impeller.

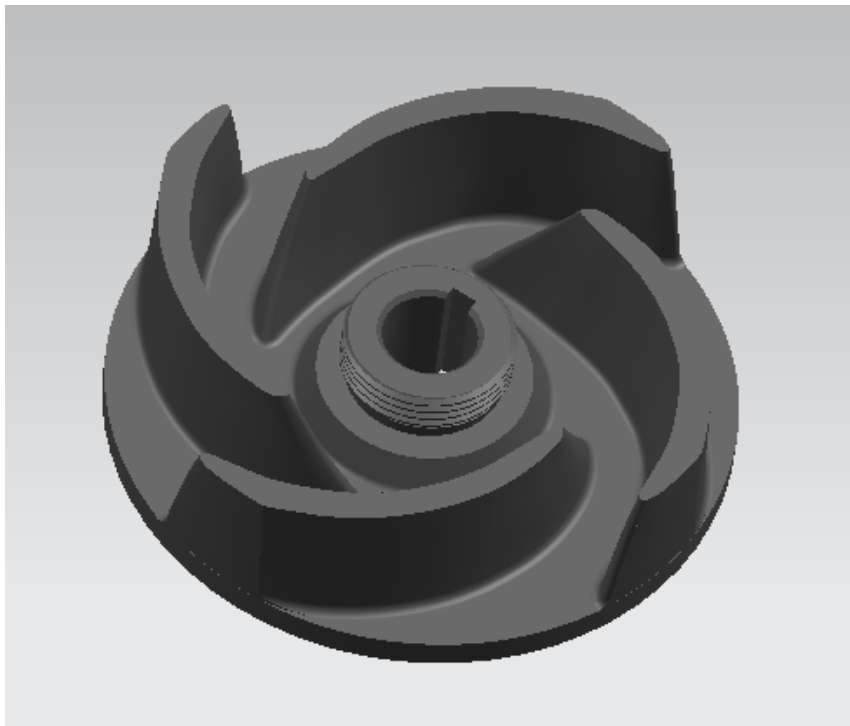


- ③ It has blank places or not complete places. So, we modify it on application whose name is “Geomagic Studio”. We particularly modify its surface.



- ④ It doesn't describe a detail. For example, a spiral of screw, a small hollow or an exact angle of surface. So, we have to modify it on application whose name is “NX6”. And we can get

drafting.



6. Impression

I learned many things and enjoyed International Internship in Thailand.

Professor and my friends took me to various places. So, I could often gone sightseeing in Bangkok.

And they are very kind for me. They took care of me all the time. I'm very thankful to them.

Also, I'm very thankful to Mie University for giving me this opportunity.