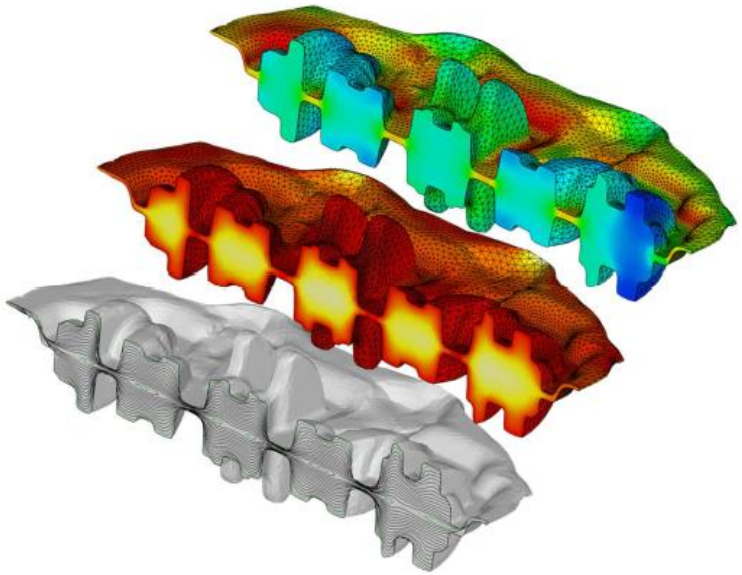
GISPAM 2016


Welcome to GISPAM 2016
GISPAM GNU International Summer Program of
AFDEX and other Engineering Softwares for the State of Mexico
Sponsor by the State of Mexico and BK 21+ Mechanical and Aerospace Program
2016.07.18~2016.08.20
Welcome to GISPAM

GISPAM2016 - Students

GISPAM 2016

GNU International Summer Program of AFDEX and other Engineering Softwares for the State of Mexico



July 18 ~ August 20, 2016

Gyeongsang National University

OMAR

CHRISTIAN

ALEXANDER

MIGUEL

JOSE ANTONIO

JESSICA MELINA

FELIX

JEAN MICHELL

JOSUE ISAI

EMMANUEL

CARLOS ENRIQUE

DAVID

OSCAR CASARROJA

ANA KAREN

FLOR DEL CARMEN

LUIS ANTONIO

MIROSLAVA

OSCAR GUZMAN

ILEANA

CARLOS JOSHUA

GISPAM 2016 - STAFF

Prof. Mansoo JOUN

Prof. Jangho LEE

Prof. Sujin KIM

Prof. Wookryol HWANG

M.Irani

Pyeong-gu KIM
(SOLID ENG)

Byung-gi PYO
(VMTech)

Jooho JUNG
(VMTech)

Sungho BAEK
(FunctionBay)

Yongwoo JOUN
(FunctionBay)

Nick JIN

Youngsin KIM

Vivian LEE

Yoseph LEE

Akash Meena

Chang-il Kang

GISPAM 2016 - Contact Information

Name	e-mail	Name	e-mail
Prof. Mansoo JOUN	msjoun@gnu.ac.kr	Prof. Jangho LEE	jhlee@afdex.com
Prof. Sujin KIM	sujinkim@gnu.ac.kr	Prof. Wookryol HWANG	wrhwang@gnu.ac.kr
Pyeong-gu KIM	pkkim@solideng.co.kr	Byung-gi PYO	pyo@vmtech.co.kr
Jooho JUNG	j2h1095@vmtech.co.kr	Sungho BAEK	sunghob@functionbay.co.kr
Yongwoo JOUN	jywkorea@functionbay.co.kr		
Dr. Seoghwan JEONG	shchung@afdex.com	M.Irani	meisam.irani@gmail.com
Vivian Lee	jelee@afdex.com	Akash	akashnsitian10@gmail.com
Y.S. Kim	yskim@afdex.com	Nick	htjin@afdex.com
C.I. Kang	kce1205@naver.com	Yoseph	yslee@afdex.com
JESSICA MELINA	camperojessica@gmail.com	CARLOS ENRIQUE	carlos.navarro.gallegos@gmail.com
DELIA MIROSLAVA	deliamiroslavamb@gmail.com	ANA KAREN	akvp.281@gmail.com
CHRISTIAN	Khristianmarduk@gmail.com	FELIX	dragoupa@yahoo.com
LUIS ANTONIO	Antonio.sandoval@live.com.mx	OMAR	ing.omar_gonzalez2015@outlook.com
EMMANUEL	emmanuel.rogel@hotmail.com	ILEANA	ilereseng_94@hotmail.com
FLOR DEL CARMEN	florecyta_skandie@hotmail.com	JOSE ANTONIO	zuca9106@hotmail.com
OSCAR	oscar.casarroja@hotmail.com	JEAN MICHELL	soulcalibur13@yahoo.com.mx
OSCAR	oscarsolanoguzman@gmail.com	MIGUEL ANGEL	miguel_chavgar@hotmail.com
DAVID ALFREDO	d-a-s-c@hotmail.com	JOSUE ISAI	josueguzman5@hotmail.com
RICARDO ALEXANDER	hch_alex@hotmail.com	CARLOS JOSHUA	sd.cjag@gmail.com

GISPAM 2016 - Schedule

	Contents of Education
1st Week	• Orientation • Basic Theory • 2D CAD
2nd Week	• 3D CAD (CATIA) • CAE practice
3rd Week	• FEM • AFDEX 3D • MAPS 3D
4th Week	• RecurDyn • Team Project • Evaluation
5th Week	• Culture/history tour • Industry tour • MFCAE 2016

(주)솔리드이엔지 SolidEng

CATIA

AUTODESK AUTOCAD

MFRC Metal Forming Research Corporation

AFDEX Adviser for metal Forming process Design EXpert

VM Tech CAD/CAM/CAE (주) 브이엠테크

MAPS 3D Mold Analysis and Plastics Solutions

Function Bay FunctionBay, Inc.

RECURDYN


2016 GNU International Summer Programs
MAIE
GKS-ASEAN
The State of Mexico
GISPAM
Cambodia, Indonesia, Laos, Malaysia, Philippines , Republic of the Union of Myanmar, Thailand, Vietnam

The 1st week

The 1st week

Schedule

Week1			Morning(~ 12 : 00)	Afternoon(~ 18:00)	Evening (18:00 ~)	
July	18	Mon	Orientation	Manufacturing Engineering and industry	Welcome party	Dormitory
	19	Tue	About Korea		Homework	Dormitory
	20	Wed	Basic mathematics, Statics		Homework	Dormitory
	21	Thu	Introduction to Solid Mechanics, 2D CAD for CAE		Homework	Dormitory
	22	Fri	AFDEX 2D, CAE Practice		Rest	Dormitory
	23	Sat	[Tour-1] Jinju city tour		Rest	Dormitory
	24	Sun	Free time		Rest	Dormitory

Opening Ceremony/Orientation / Manufacturing Eng.

Welcome Dinner Party!







Mathematical Backgrounds and Basic Mechanics

Jinju Tour

Jinju Tour










The 2nd week

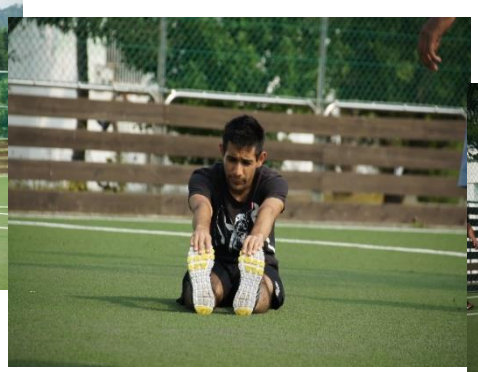
The 2nd week

Schedule

Week2			Morning(~ 12 : 00)	Afternoon(~ 18:00)	Evening (18:00 ~)	
July	25	Mon	Fundamental of heat transfer	Solid mechanics	Homework	Dormitory
	26	Tue	3D CAD Basic I	3D CAD Basic II	Homework	Dormitory
	27	Wed	3D CAD Advanced I	3D CAD Advanced II	Homework	Dormitory
	28	Thu	3D CAD Practice I	3D CAD Practice II	Rest	Dormitory
	29	Fri	[Field trip-1] GTIC, KITECH	[Field trip-2, Tour-2] POSCO	Rest	Dormitory
	30	Sat	[Tour-3] Busan city tour		Rest	Dormitory
	31	Sun	Free time		Rest	Dormitory

CATIA

Soccer & Chicken-Beer Party







KITECH & GNU/TIC & POSCO

Busan

The 3rd week

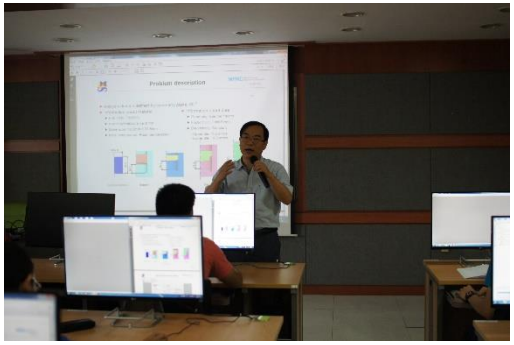
The 3rd week

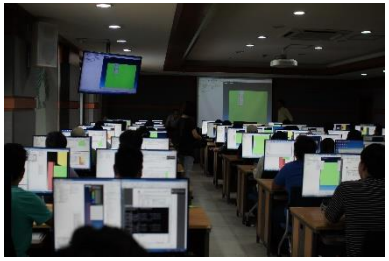
Schedule

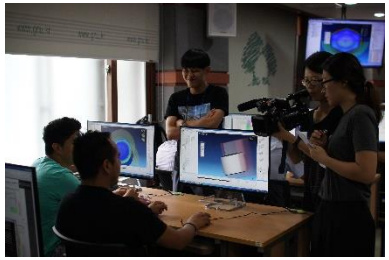
Week3			Morning(~ 12 : 00)	Afternoon(~ 18:00)	Evening (18:00 ~)	
Aug	1	Mon	Fundamental of heat transfer	Theory of plasticity	Homework	Dormitory
	2	Tue	FEM	AFDEX 3D	Homework	Dormitory
	3	Wed	AFDEX 3D Practice	MAPS 3D	Homework	Dormitory
	4	Thu	MAPS 3D	MAPS 3D	Homework	Dormitory
	5	Fri	MAPS 3D	MAPS 3D	Rest	Dormitory
	6	Sat	[Tour-4] Namhae, Sangju Beach		Rest	Dormitory
	7	Sun	Free time		Rest	Dormitory

Theory – Advanced Solid Mechanics and FEM

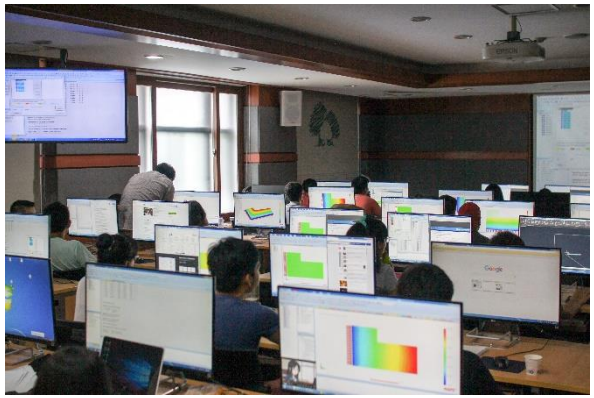
Process Design Using AFDEX

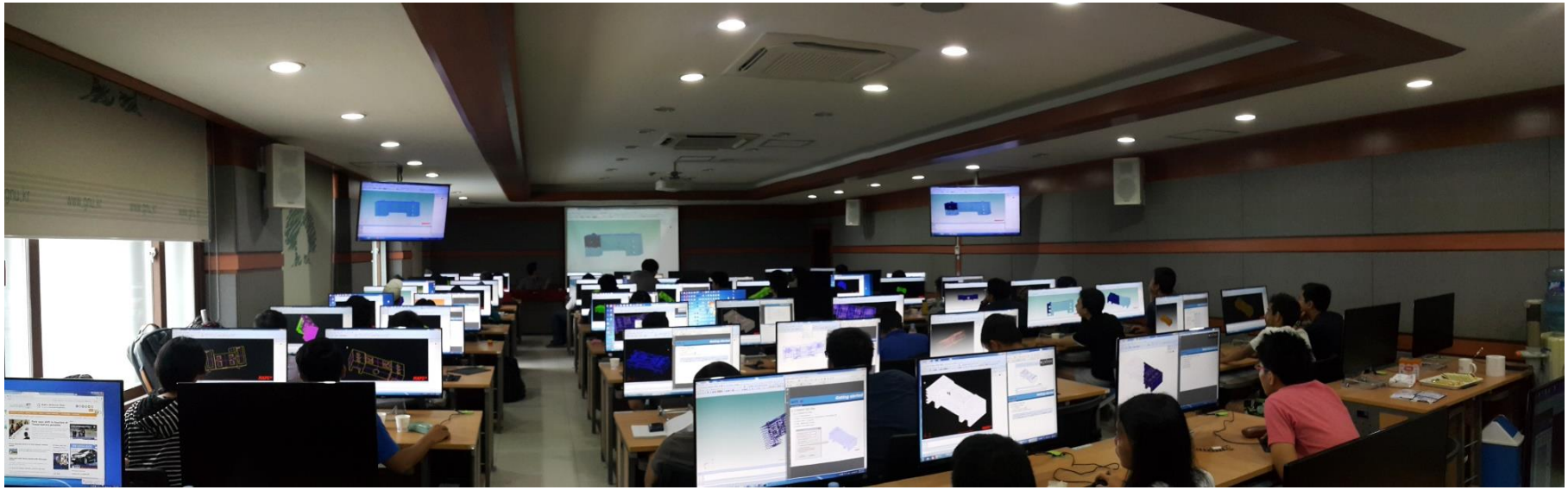




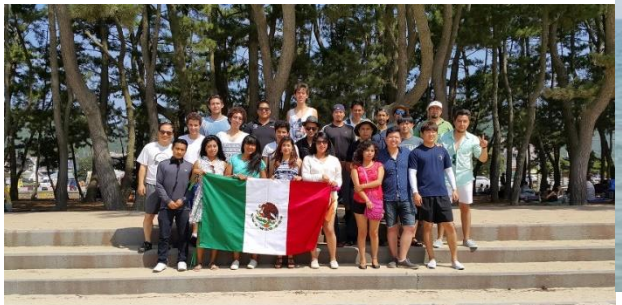


MAPS 3D





Sangju Beach and Pork Barbecue Party



Pork Barbecue Party


Welcome to GISPAM 2016
GISPAM GNU International Summer Program of
AFDEX and other Engineering Softwares for the State of Mexico
Sponsor by the State of Mexico and BK 21+ Mechanical and Aerospace Program
2016.07.18~2016.08.20

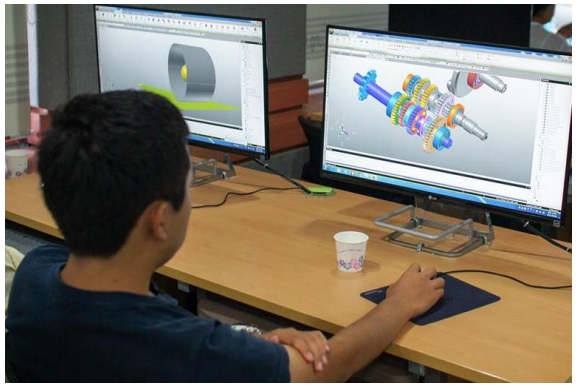
The 4th week

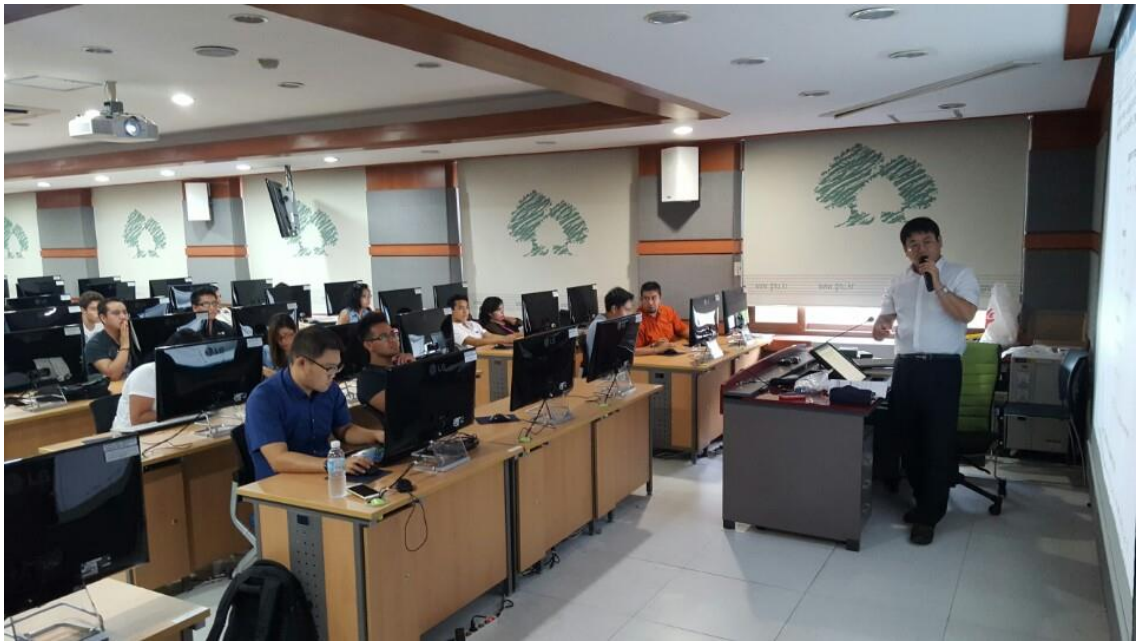
The 4th week

Schedule

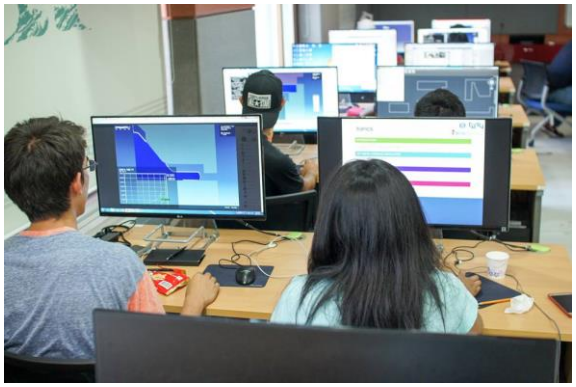
Week4			Morning(~ 12 : 00)	Afternoon(~ 18:00)	Evening (18:00 ~)	
Aug	8	Mon	Dynamics	RecurDyn	Homework	Dormitory
	9	Tue	RecurDyn	RecurDyn	Homework	Dormitory
	10	Wed	RecurDyn	RecurDyn	Homework	Dormitory
	11	Thu	PPT skill	Team project I	Homework	Dormitory
	12	Fri	Team project II	Team project evaluation	Farewell Party	Dormitory
	13	Sat	[Tour-5] Seoul culture experience		Rest	Seoul
	14	Sun	[Tour-6] Seoul culture experience		Rest	Seoul

RecurDyn

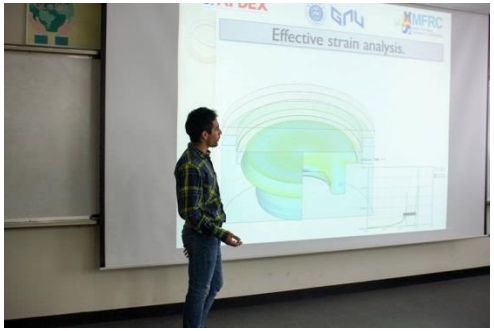




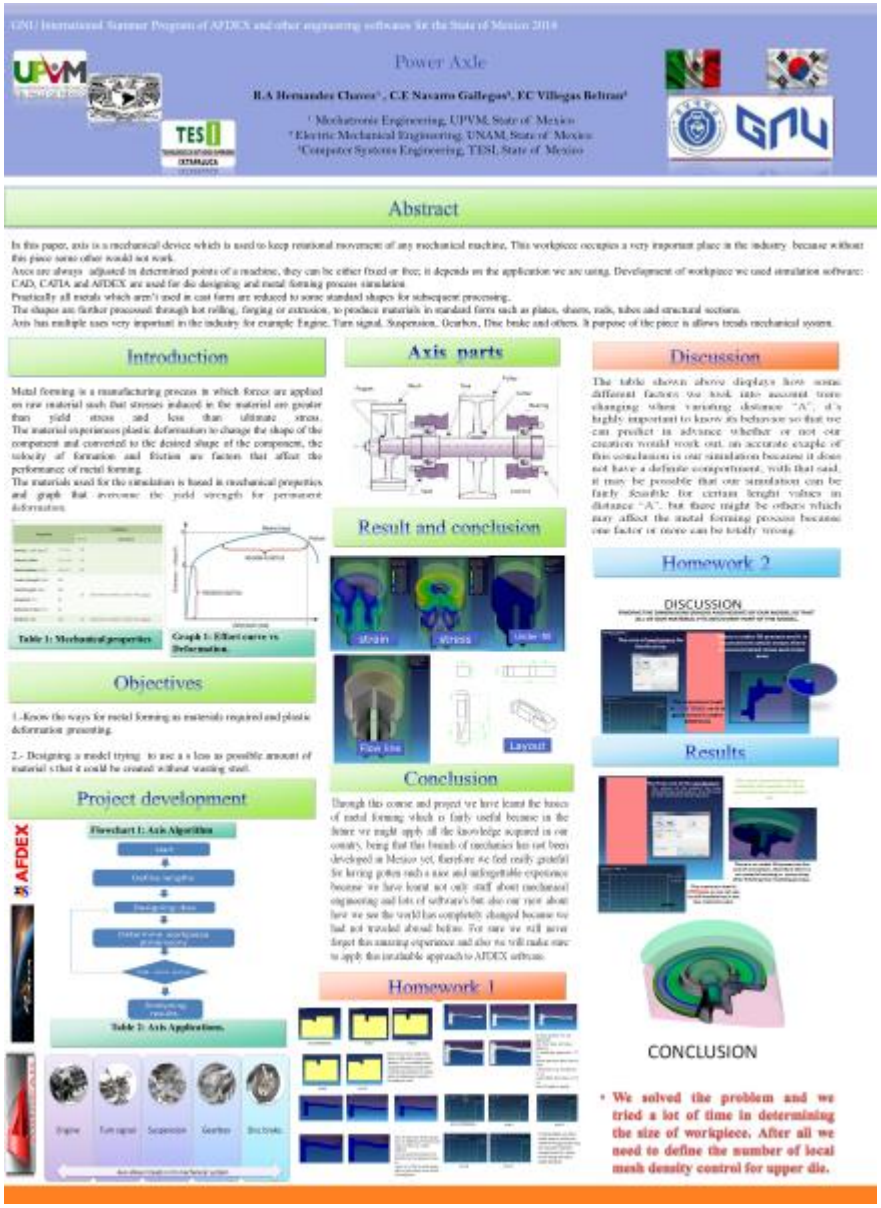
Preparing Final Presentation and Traditional Dish

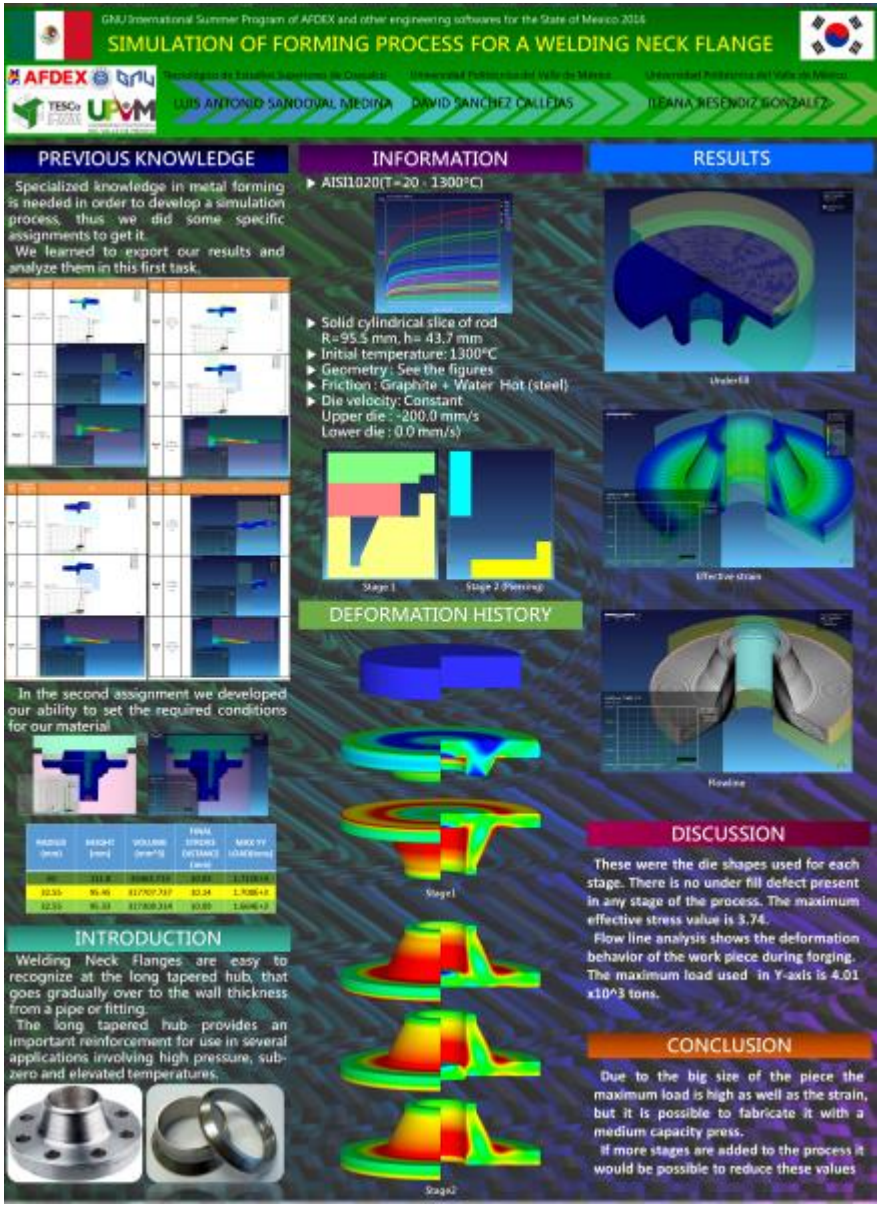


Final Presentation

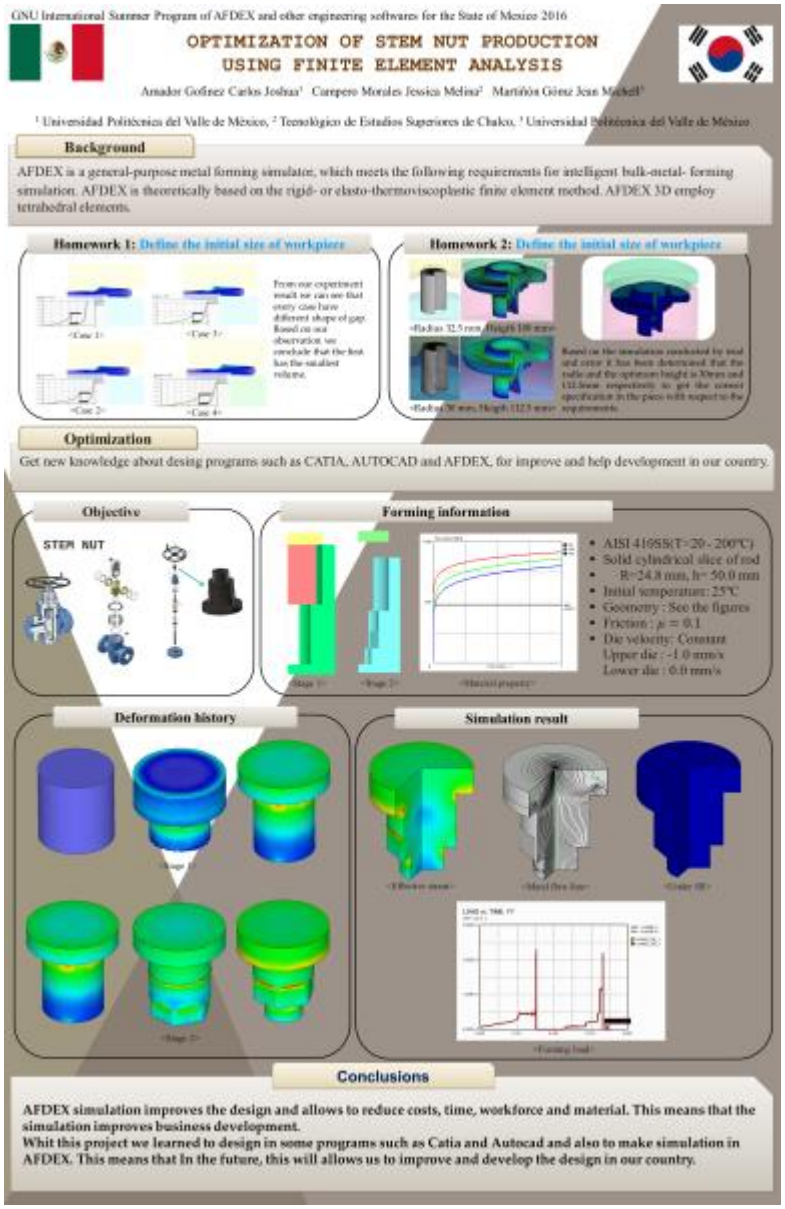


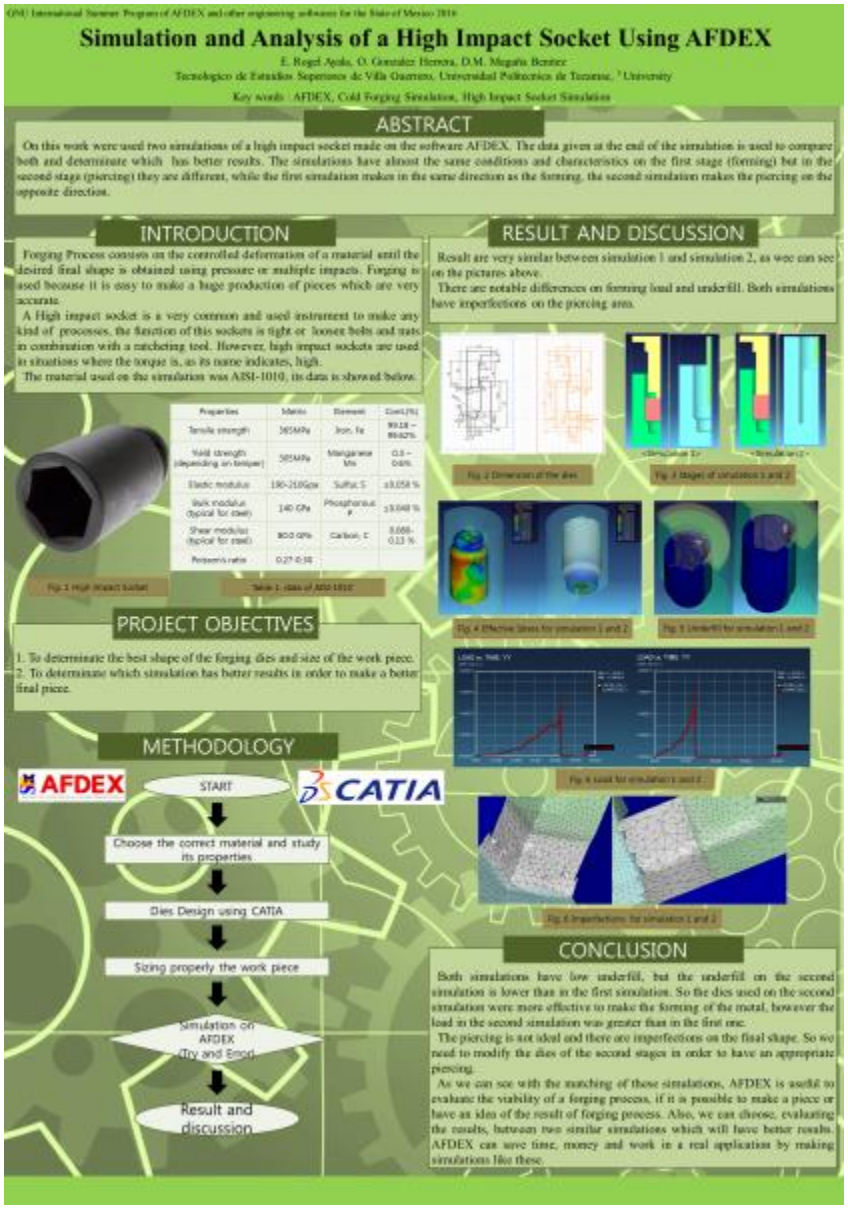
Poster – MFCAE 2016/Education





Poster – MFCAE 2016/Education





Poster – MFCAE 2016/Education

GNU International Summer Program of AFDEX and other Engineering Softwares for the State of Mexico 2016

MicroForming Process of Flange

C. Avalos[1], O. Casarroja[2], A. Valle[3], J. Zuniga[4] , Y. S. Kim[5]

[1] Tecnologico de Estudios Superiores de Coacalco, [2] Tecnologico de Estudios Superiores de Ixtapaluca, [3] Universidad Politecnica de Atlaulta, [4] Universidad Politecnica del Valle de Mexico, [5]Gyeongsang National University

Abstract

This paper contains the main applications about the use of software as: AutoCAD, CATIA and AFDEX.
So, AutoCAD had been made the mold design, CATIA had been made the design of flange in 3D and finally AFDEX had been to simulation of process , in where , AFDEX has the quality to simulate hot process or cold process, showing the different characteristics that can have the different process.

Micro Forming

Micro forming is a well suited technology to manufacture very small metallic parts, in particular for mass production, as they are required in many industrial products resulting from micro technology.

Review

Before making this project, we perform two tasks to practice our acquired skills in AutoCAD, CATIA and AFDEX, the tasks were made with Asian students.
The first activity consisted in make a complete simulation about a piece and the second task consisted in change the measures to find the appropriate workpiece volume.

Figure1. First task

Figure2. Second task

Figure7. Conceptos

Designs

Figure3. Mold design

Figure4. CATIA Design

Results

Figure5. Load vs time

Figure6. Flow line

Process condition

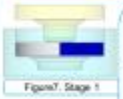


Figure7. Stage 1

-Isothermal analysis
-Cold forming
-Material: AISI 1010
-Initial material volume: 113.14 mm³
-Velocity of die
Upper=-1mm/s
Lower=0 mm/s

Simulation

Figure8. Stages

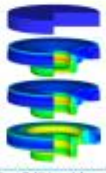


Figure9. History deformation

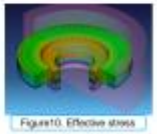


Figure10. Effective stress

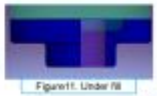


Figure11. Under fill

Conclusion

Metal forming process before its production need to be developed whit help of CAD and CAE software, permitting save manufacturing-cost and manufacturing-time.

With this simulation we are able to solve many needs in different manufacturing areas like aerospace, automotive, microforming, medical, among.

Gyeongsan National University

GNU International Summer Program of AFDEX and other engineering softwares for the State of Mexico 2016

Applying forging process for designing of wheel hub using AFDEX & CAD Softwares

O. Guzman[1], F. Hipolito Mercado[2], M. A. Chavez Garcia[3], J. L. Guzman Avalos[4]

[1] Universidad Nacional Autonoma de Mexico, [2] Universidad Politecnica de Atlacomulco, [3] Universidad Politecnica del Valle de Mexico, [4] Universidad Politecnica del Valle de Mexico

Abstract

Currently, the traditional method of wheel hub making is by CNC lathe, which is very expensive, takes a lot of time and waste material (shavings). This paper introduces a solution of the problems commented above by the analysis and design of wheel hub using forging process as an alternative method of production, with the support of different engineering software as AFDEX, Catia and AutoCad. The analysis is composed of three stages, that is, workpiece and dies optimal sizes, stroke and material quantity, simulations and final results.

Research Background

Fig 1. Lathe turning material

Fig 2. CNC lathe

Fig 3. Material wasting (shavings)

Flow chart of solving

About Homework 2

Fig 6. Dies and piecework design

Fig 7. First design shows empty spaces

Fig 8. Piecework size modification

Fig 9. 2D simulation and Load vs YY graph analysis

Fig 10. Modification of mesh density parameters

Fig 11. 2D Workpiece and dies.

Physical properties of AISI 52100

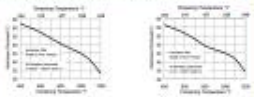


Fig 4. Graphs that show properties of material

Forging load calculation

$$U_{total} = U_{ideal} + U_{friction} + U_{redundant}$$

$$\eta = \frac{U_{ideal}}{U_{total}}$$

Equation of total energy required for deformation process and efficiency of a given deformation process

Workpiece and dies design

Fig 5. Size of workpiece and dies

Workpiece and dies design

Fig 12. Catia 3D workpiece

Fig 13. AutoCad draws. Using 2D analysis saves time.

Fig 14. AutoCad draws. Using 2D analysis saves time.

Load vs XX and YY

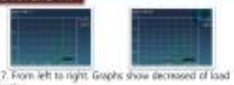


Fig 17. From left to right. Graphs show decreased of load application

Fig 15. From left to right. Comparation between flow lines. Right picture is final result

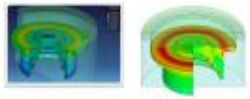


Fig 16. From left to right. Comparation between stress distribution. Right picture is final result

Conclusions

- Final results of stress and strain are low. This can be interpreted as money saving because we do not need a large machine to applied a small force.
- Flow lines are uniformly separated, this means piecework is less propensive to present failure zones (cracks).
- Initial full fill problem was solved by modifying the deepest part of the workpiece and increasing the radius of chamfer.
- Pressure decrease a lot after many modifications of workpiece and dies because corners get a softer shape.
- Better distribution of material amoung workpiece.

AFDEX GNU MFRC

The 5th week

The 5th week

Schedule

Week5			Morning(~ 12 : 00)	Afternoon(~ 18:00)	Evening (18:00 ~)	
Aug	15	Mon	[Tour-7] Seoul culture experience		Rest	Gyeongju
	16	Tue	[Field trip-3, Tour-8] Gyeongju city tour (Sungjin FO-MA)		Rest	Gyeongju
	17	Wed	[Field trip-4, Tour-9] Gyeongju city tour (Hyundai Car Factory)		Rest	Busan
	18	Thu	MFCAE 2016		Rest	Jeju
	19	Fri	[Tour-10] Jeju tour		Farewell party	Seoul
	20	Sat	Departure to Mexico			

Seoul Tour - Learning Dance & TaeKwonDo

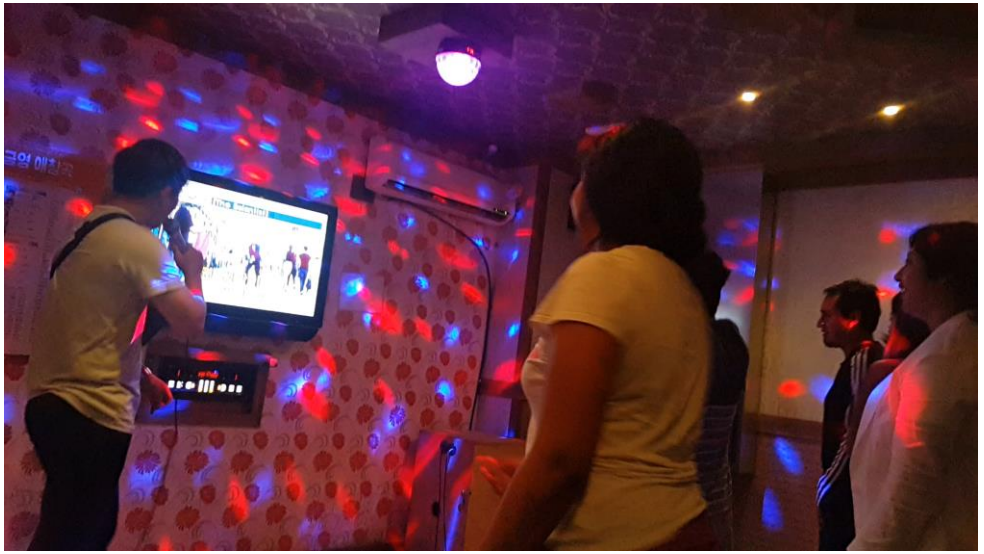
Seoul Tour

Gyeongju Tour


Bulguksa


Cheomsungdae

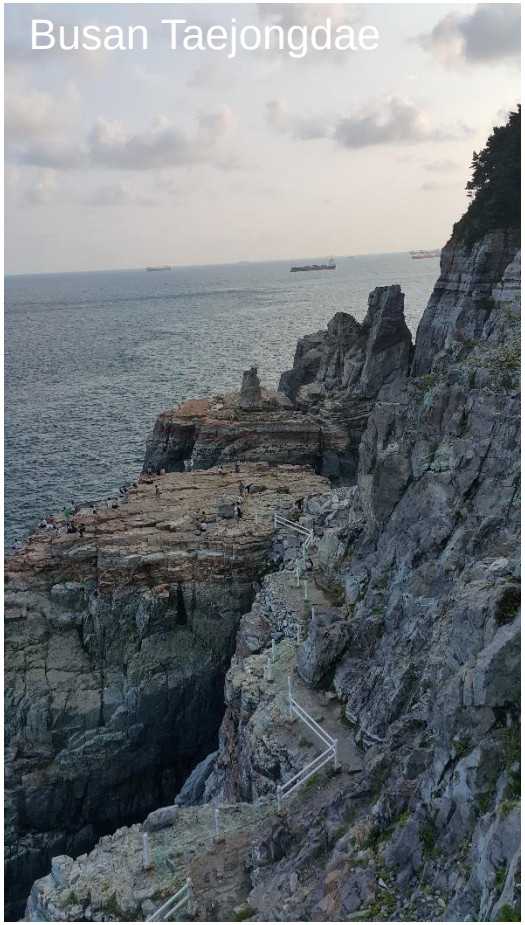

Dabotap




Seokgulam

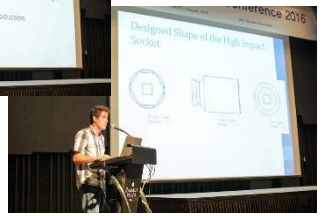
Daegu/SungJin Fo-Ma & Ulsan/Hyundai Motors & Busan

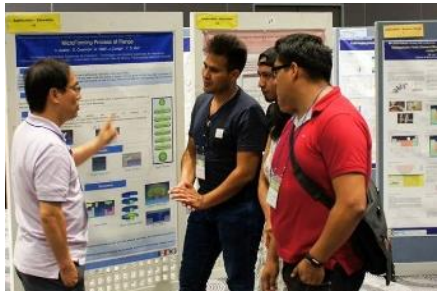
SungJin Fo-Ma

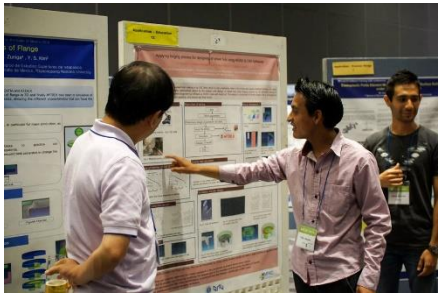


Hyundai Motors

MFCAE 2016 – an International Metal Forming CAE Conference 2016







Jeju Volcanic Island Tour

Sungsanilchulbong

Subjicoji

Unfortunately we see only 2%.

We were together

at GISPAM 2016

Participants Survey Result for GISPAM 2016

Curriculum

1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent. (Unit : Persons)

		1	2	3	4	5
1	Orientation				4	16
2	Basic mathematics, Statics, Solid mechanics				1	19
3	Solid mechanics II, Foundations of heat transfer, FEM				1	19
4	3D CAD Basic, Advanced, Practice			1		19
5	AFDEX 2D Basic & Practice				3	17
6	AFDEX 3D Basic & Practice				3	17
7	MAPS-3D				4	16
8	RecurDyn		1	1	3	15
	Total	0	1	2	19	138

Facilities & Service

1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent. (Unit : Persons)

		1	2	3	4	5
1	The quality of the dormitory cafeteria (Breakfast, Dinner)		1	8	4	7
2	The quality of the staff restaurant (Lunch)			4	7	9
3	The quality of the student dormitory			1	5	14
4	The quality of education places				3	17
5	Support of managers			1	5	14
	Total	0	1	14	24	61

Curriculum

1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent. (Unit : Persons)

		1	2	3	4	5
1	GTIC & KITECH (29th Jul.)				3	17
2	POSCO (29th Jul.)				2	18
3	Jinju city tour (23th Jul.)				3	17
4	Busan city tour (30th Jul.)				2	18
5	Namhae, Sangju Beach (6th Aug.)				2	18
6	Seoul city tour (13~15th Aug.)				1	19
7	Gyeongju city tour & Culture experience (16~17th Aug.)				3	17
8	Sungjin FO-MA (16th Aug.)				2	18
9	Hyundai car factory (17th Aug.)				1	19
10	MFCAE 2016 (18th Aug.)				2	18
11	Jeju city tour (19th Aug.)				2	18
	Total	0	0	0	23	197

Facilities & Service

1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent. (Unit : Persons)

		1	2	3	4	5
1	Do you recommend GISPAM 2016 to your friends?				2	18

Average in total for each evaluation item

1: Poor, 2: Average, 3: Good, 4: Very Good, 5: Excellent. (Unit : Persons)

		1	2	3	4	5
	Curriculum	0.00	1.00	1.00	2.71	17.25
	Facilities & service	0.00	1.00	3.50	4.80	12.2
	Tour	0.00	0.00	0.00	2.09	17.91
	Satisfaction	0.00	0.00	0.00	2.00	18.0

Adiós GISPAM2016