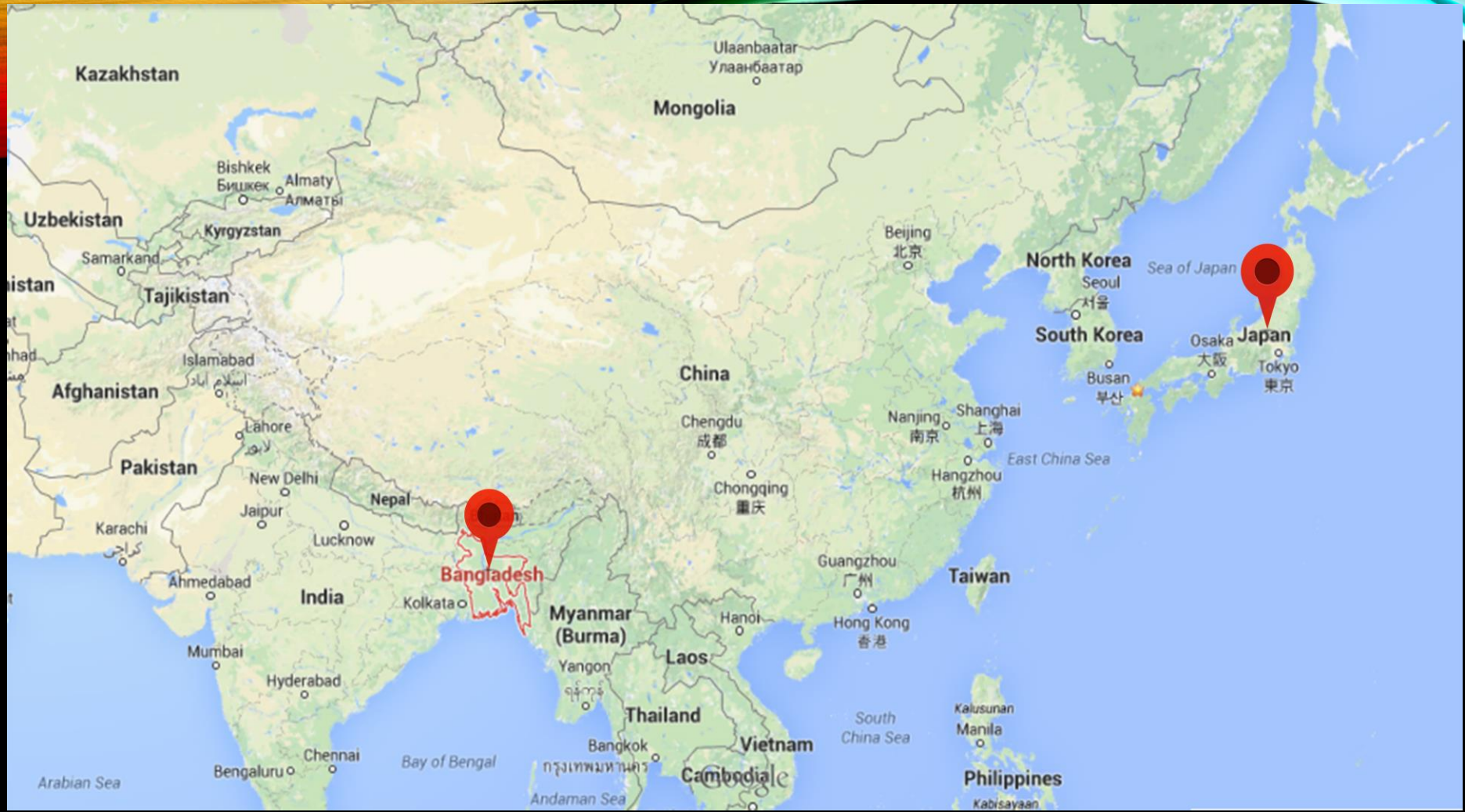
UNISEC-BRACU

ABDULLA HIL KAFI
Special Audit Student , KIT, Japan
BRAC UNIVERSITY
BANGLADESH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北京
North Korea
Sea of Japan
Seoul
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Osaka
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Japan
Tokyo
東京
Busan
부산
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Nanjing
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Pakistan
New Delhi
Hangzhou
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Jaipur
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Lucknow
Bangladesh
Guangzhou
广州
Taiwan
Ahmedabad
India
Kolkata
Myanmar
(Burma)
Hanoi
Hong Kong
香港
Mumbai
Laos
Yangon
Hyderabad
Thailand
South
China Sea
Kalusunan
Manila
Chennai
Bangkok
Vietnam
Bay of Bengal
Bengaluru
Cambodia
Philippines
Arabian Sea
Andaman Sea
Kabisayaan

HISTORY

- What triggered our interest in Space Science…..

MOTIVATION

1. Improve the socio economic, agricultural and weather forecasting/monitoring system of Bangladesh.
2. Adapt the small-satellite (low cost-fast delivery) technology and space science through education and practice.

OBJECTIVES

1. Designing a nano-satellite with missions for the first time in Bangladesh.
2. Knowing hands on experience and project based learning to develop a nano-satellite from design to implementation.
3. Make people interest in space science & technology

OUR GOAL

Name of our satellite: BDSATCUBE

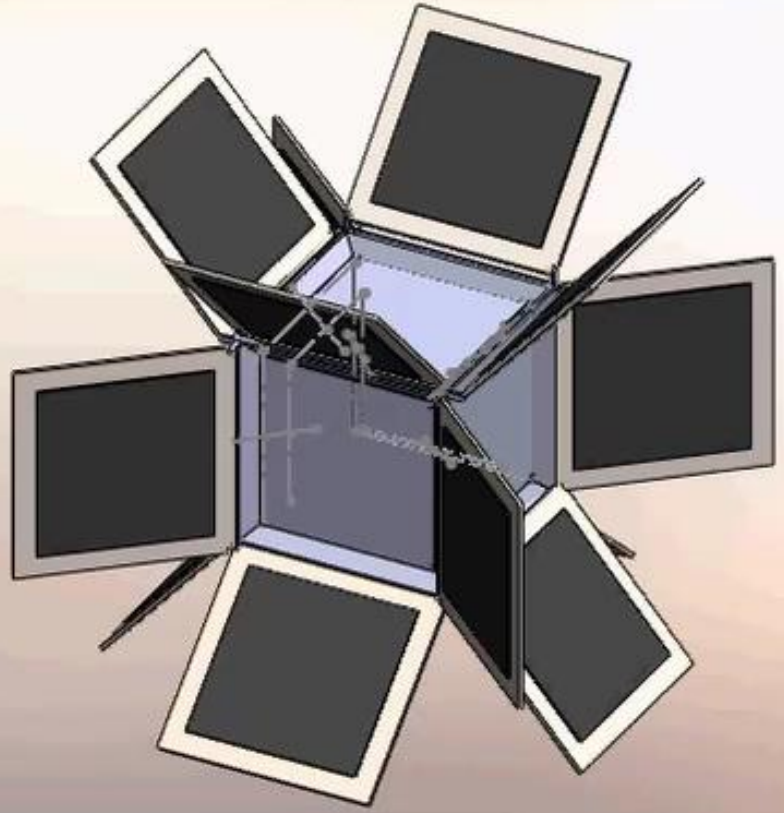
Mission: Remote sensing device , Modularity

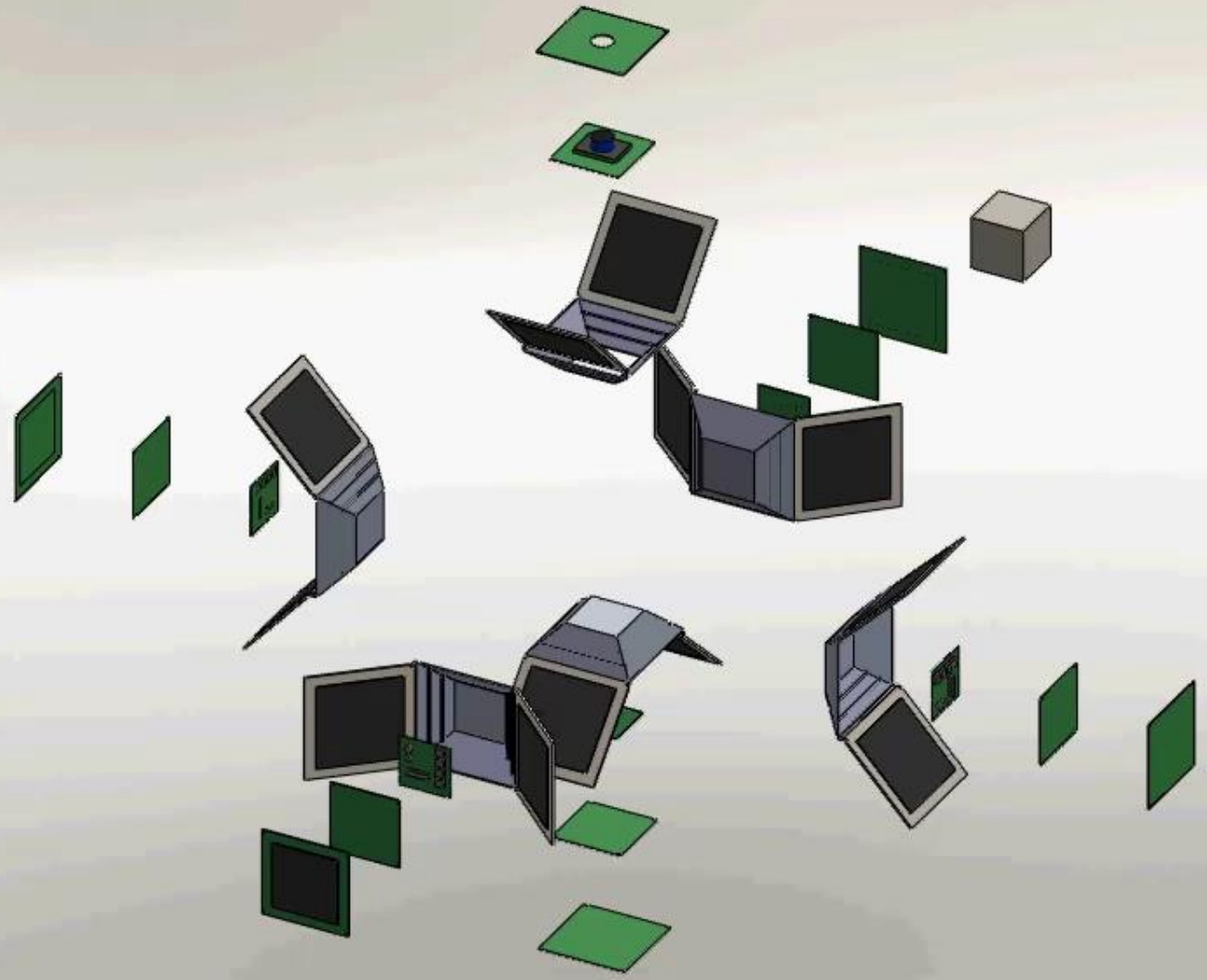
Concept Model:

Dimension : 20cm x 20cm x 20cm

Material : Aluminum

Mass：4-6Kg





CONCEPT PAPER IN AERO EARTH CONFERENCE

- **The 2014 International Conferences on Geological, Geographical, Aerospace and Earth Sciences (Aero Earth 2014)**

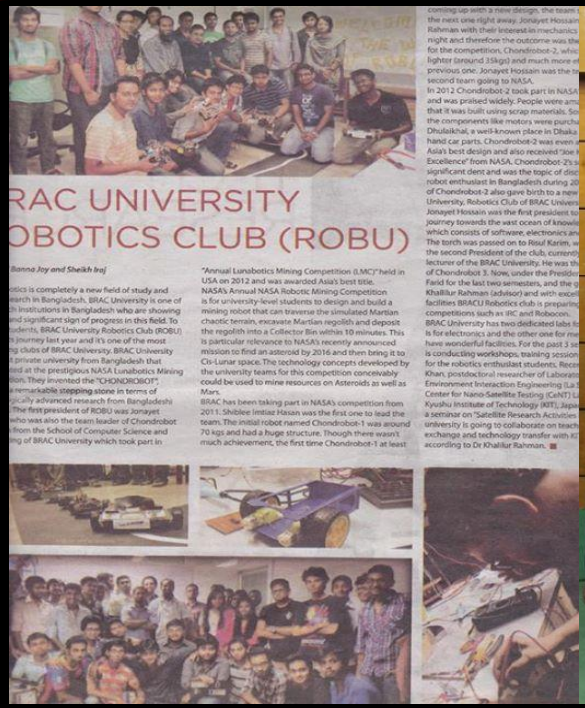
Title :
"Exploring Modular Architecture for Nano-Satellite and Opportunity for Developing Countries"

https://dl.dropboxusercontent.com/u/105973635/aero%202014.pdf

FUNDING

- National: BRAC University, Other BRAC sister concerns,Local Sponser, Bangladesh Government
- International: JICA, World Bank

Activities



RAC UNIVERSITY
OBOTICS CLUB (ROBU)

Banna Joy and Sheikh Iraj

...otics is completely a new field of study and ...earch in Bangladesh, BRAC University is one of ...h institutions in Bangladesh who are showing ...ome significant sign of progress in this field. To ...udents, BRAC University Robotics Club (ROBU) ...s journey last year and it's one of the most ...ng clubs of BRAC University. BRAC University ...s private university from Bangladesh that ...ded at the prestigious NASA Lunabotics Mining ...tion. They invented the "CHONDROBOT", ...a remarkable stepping stone in terms of ...ically advanced research from Bangladeshi ...The first president of ROBU was Jonayet ...who was also the team leader of Chondrobot ...from the School of Computer Science and ...ing of BRAC University which took part in "Annual Lunabotics Mining Competition (LMC)" held in USA on 2012 and was awarded Asia's best title. NASA's Annual NASA Robotic Mining Competition is for university-level students to design and build a mining robot that can traverse the simulated Martian chaotic terrain, excavate Martian regolith and deposit the regolith into a Collector Bin within 10 minutes. This is particular relevance to NASA's recently announced mission to find an asteroid by 2016 and then bring it to Cis-Lunar space. The technology concepts developed by the university teams for this competition conceivably could be used to mine resources on Asteroids as well as Mars.

BRAC has been taking part in NASA's competition from 2011. Shiblee Imtiaz Hasan was the first one to lead the team. The initial robot named Chondrobot-1 was around 70 kgs and had a huge structure. Though there wasn't much achievement, the first time Chondrobot-1 at least coming up with a new design, the team ... the next one right away. Jonayet Hossain ... Rahman with their interest in mechanics ... night and therefore the outcome was the ... for the competition, Chondrobot-2, whic... lighter (around 35kgs) and much more ... previous one. Jonayet Hossain was the t... second team going to NASA.

In 2012 Chondrobot-2 took part in NASA ... and was praised widely. People were am... that it was built using scrap materials. So... the components like motors were purch... Dhulaikhal, a well-known place in Dhaka ... hand car parts. Chondrobot-2 was even ... Asia's best design and also received "Joe ... Excellence" from NASA. Chondrobot-2's ... significant dent and was the topic of disc... robot enthusiast in Bangladesh during 20... of Chondrobot-2 also gave birth to a new ... University, Robotics Club of BRAC Univers... Jonayet Hossain was the first president to ... journey towards the west ocean of knowle... which consists of software, electronics an... The torch was passed on to Risul Karim, w... the second President of the club, current... lecturer of the BRAC University. He was th... of Chondrobot 3. Now, under the Presid... Farid for the last two semesters, and the g... Khalilur Rahman (advisor) and with excel... facilities BRACU Robotics club is preparing ... competitions such as IRC and Robocon.

BRAC University has two dedicated labs fo... is for electronics and the other one for me... have wonderful facilities. For the past 3 se... is conducting workshops, training session... for the robotics enthusiast students. Recen... Khan, postdoctoral researcher of Laborato... Environment Interaction Engineering (La... Center for Nano-Satellite Testing (CeNT) L... Kyushu Institute of Technology (KIT), Japa... a seminar on "Satellite Research Activities ... university is going to collaborate on teach... exchange and technology transfer with KI... according to Dr Khalilur Rahman.

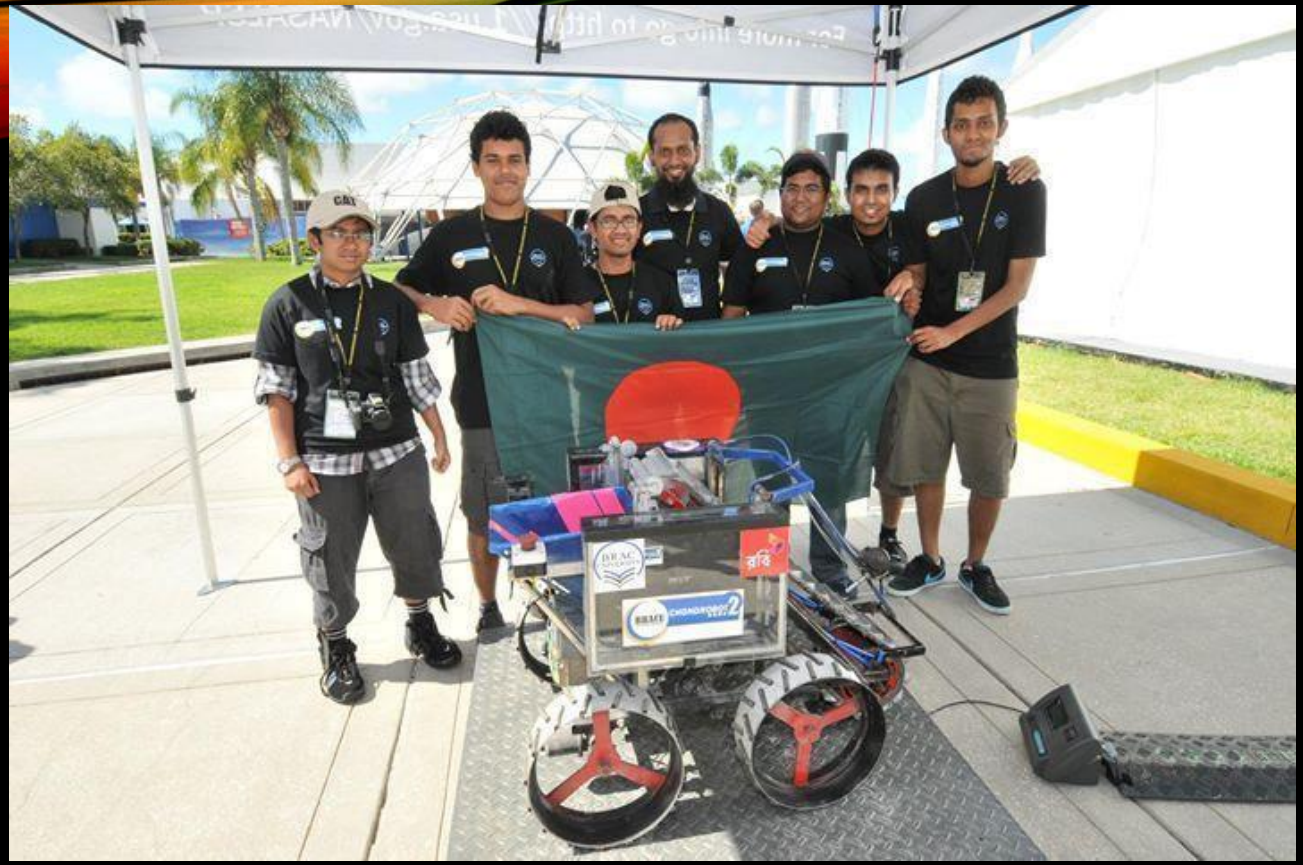
Line follower Robot Competition in BRAC University

SEMINAR ON SATELLITE

Dr. Arifur R. Khan
Assistant Professor
Kyushu Institute of Technology

OUTREACH PROGRAM

Hover Exhibition



Secured 12 th position in mining category in Second NASA LMC, 2012

ON GOING RESEARCH

- UAV Based Remote Sensing
- ROV or Underwater Surveillance
- Formation Flying of RC Plane
- Quadcopter
- Rescue Robot

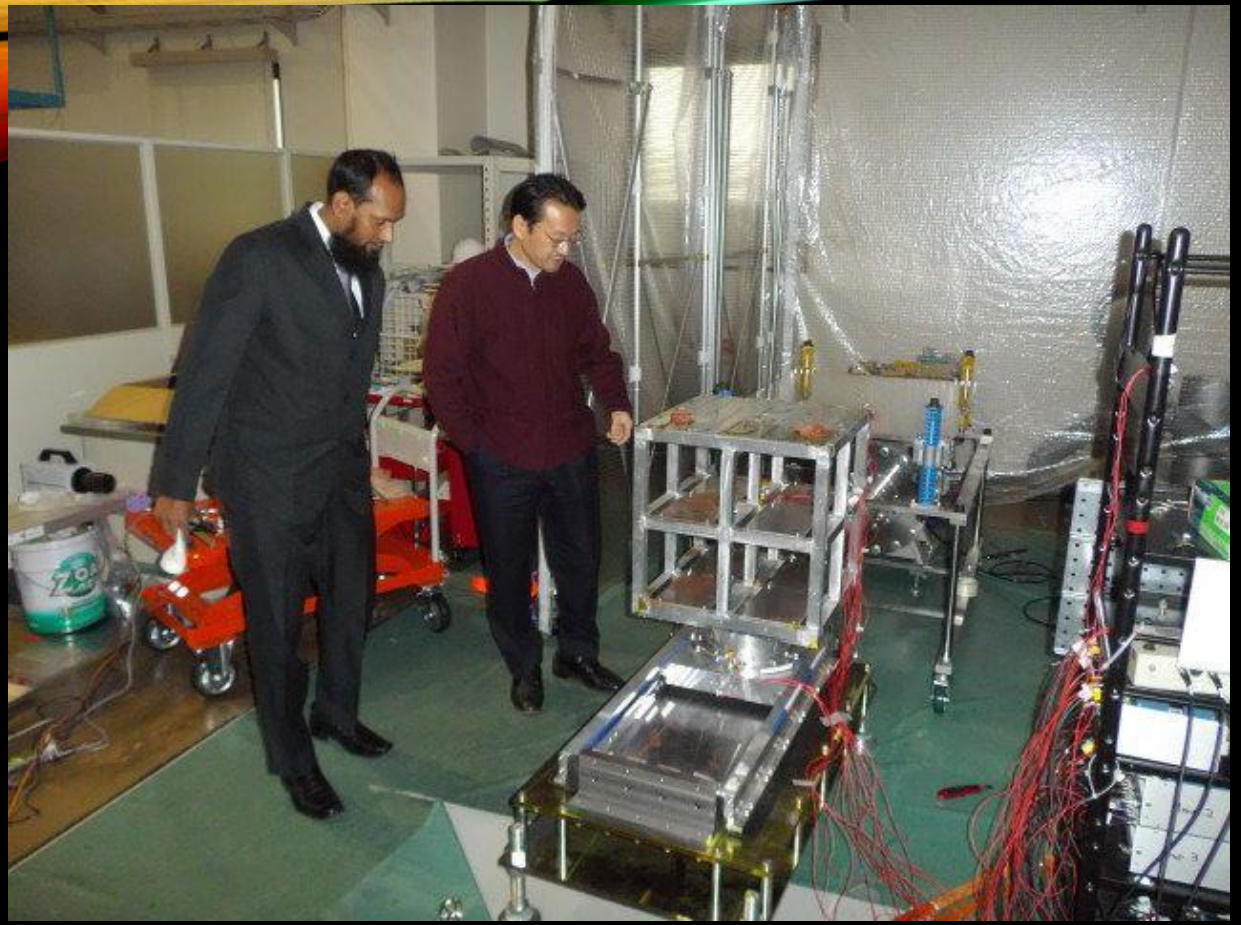
COLLABORATION WITH KYUTECH

- Faculty visit
- Student exchange
- Research collaboration
- Setup up a team on Nano Satellites / CubeSats in 5 years
- Launch a Nano Satellite / CubeSat in 10 Years (Approximately)
- Technical support

Dr Khalilur Rhaman Visited LaSEINE lab of KIT

From left Dr Khalilur Rhaman, Dr Mengu Cho, Dr. John Polansky

Pictures were taken during Dr. Khalilur Rhaman's visit to Kyushu Institute of Technology, January, 2014



Pictures were taken during Dr. Khalilur Rhaman's visit to Kyushu Institute of Technology, January, 2014

MOU

- **Bangladesh Atomic Energy Commission (BAEC)**
- **Bangladesh Space Research and Remote Sensing Organization (SPARRSO)**

FUTURE ACTIVITIES

- Organising Workshops on CANSAT by CLTP graduate Tilok Kumar: For University Students
- Water Rocket building : For High School Students (Outreach program)
- Regular Seminars with following
  - National speakers:
    - Professor Tarekul Islam
    - Dr. Md. Khalilur Rhaman
    - F. R. SARKER and
    - Tilok Kumar Das
  - International Speaker:
    - International member of Unisec
- Seminar with fresher undergrad student
- Experience sharing by exchange students

PARTICIPATION

- MARS Rover 2015
- CLTP
- ARLISS
- CubeSat Competition
- MIC

COURSE

- **EEE 739: Introduction to Satellite engineering**

  The purpose of this course is to provide an overview of satellite engineering with its emphasis on micro- and nano-satellite technologies and systems engineering approach such as verification and test.

- **EEE 738: Space Systems Engineering**

  This course covers the mission analysis and design, system design approach, systems engineering process and methodology, and management needed for space development.

TIMELINE

Building a Nano-Satellite in BRAC University Bangladesh

Project Schedule

Start Week	Jan 5, 2014

Month	1	5	9	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72
Starting	Jan, 14 5	May, 14 5	Aug, 14 25	Nov, 14 18	Mar, 15 26	Jul, 15 24	Nov, 15 21	Mar, 16 30	Aug, 16 7	Nov, 16 29	Apr, 17 8	Aug, 17 6	Dec, 17 4	Apr, 18 3	Aug, 18 1	Nov, 18 29	Apr, 19 8	Aug, 19 18	Dec, 19 16
Phase One	Feasibility Study																		
		Project and Capacity Plan																	
			Draft Design Specifications																
			Intellectual Capacity building by Student and Teacher Exchange program																
Phase Two				TODAY	Research Collaboration with KIT														
					Building Collaboration with National and International Research Community.														
					Funding Proposal														
								Final Requirements Specifications											
								Phase Review and Approval											
Phase Three								Mechanical Lab preparation and Draft Design Specifications											
									Electronics and Communication Lab Preparation and Configuration Management Plan										
									Simulation Lab Preparation and Define Interface Requirements										
										Implementation Start									
											Implementation and Indivisual Component Test								
														Integration Test					
															Final Reviw of Whole System				
																Final Integration Test			
																			PROJECT END

CONLUSION

- **We are ready to start new project in Aerospace Systems.**
- **We sow the seeds of Space Science in our country and now its time to take care of the plants to grow up.**

THANK YOU

ACKNOWLEDGEMENTS

I would like to add a special note to thank the people below who have helped me to prepare this presentation.

- Dr. Khalilur Rhaman, Chairperson & Associate Professor, Department of Computer Science and Engineering, BRAC University, Dhaka, Bangladesh.
- Dr. Arifur Rahman Khan, Assistant Professor, Laboratory of Spacecraft Environment Interaction Engineering, Kyushu Institute of Technology, Japan.
- Raihana Shams Islam Antara, President, BRAC University Robotics Club[ROBU], BRAC University, Bangladesh.
- Maisun Ibn Monowar, Special Audit Student, KyuTech, BRAC University, Bangladesh.