BeiDou Belt and Road School (B2ROS)
Beihang University

Dr. Guifei Jing
Dean of BeiDou Belt and Road School, Beihang Univ.
Beijing, China
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
Wishes

➢ Satisfy the needs of issues in countries along the Belt and Road
  – Popularization of BDS/GNSS services
  – Education and training of professional resources
  – Scholarship exchange
  – Joint R&D
  – Construction and application of infrastructure, esp. precise positioning

➢ Assistant to promotion of green growth from BDS/GNSS
  – Emerged new generation of location service to IOT
  – Enlarged scale of market with Internet economy
  – Applications to support smart governance of society
  – Location and trace of goods for global flow of things
Ways and means

- Collaborated with top universities in related countries along the Belt and road
  - Organize and manage the school jointly
  - Share perspective achievements of knowledge, curriculum, facilities
  - Exchange of teachers, students
  - Support training courses jointly
  - Cooperate on R&D of BDS/GNSS and its applications

- Focus on BDS/GNSS
  - Scholarship education to increase numbers of professional resources
  - Training and exhibitions to let more citizens know and use this technology
  - Joint R&D of integration with IOT, Big data, to provide service daily and reliable
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
Office in HQ of Beihang Univ.
Architecture of B2ROS

UN Regional Centre in China
/ICG Information Center

Governing Board

BeiDou Belt&Road School

International Expert Committee

Advisory Committee

Teaching Center
BeiDou International Exchange and Training Center
BeiDou Laboratory for Education
BeiDou Service Center for Overseas Promotion

BDS/GNSS Education and Research Network for the Belt and Road Countries

Partner Universities:
- National University of Sciences and Technology (Pakistan)
- Chulalongkorn University (Thailand)
- Jahangirnagar University (Bangladesh)

......
Prof. Naweed Zaman, president of NUST, and prof. Huibin Xu, president of Beihang, Signed MOU in Beijing in May 2017
BeiDou/GNSS Education and Research Network (NERN)

- Initiated and started from Beihang University, join and access by every co-construction partner welcomed
- Vital facility for B2ROS, linkage of partners
- Contents includes education material and research tools
  - Textbooks, presentations, teaching and lecture videos, test papers
  - Software and data for fieldwork
  - Blueprint of NDS/GNSS development, market
  - Census of BDS/GNSS
  - Policy and consultant
  - Enterprises and products
- Each node of NERN is equal
- New participation will be supported, a local node at first time
Main campus of school located in Suzhou, Jiangsu Province, close to Taihu Lake
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
Scholarship education

- Distinguishing discipline system
  - Belong to first-grade disciplines of Information and communication engineering, Control science and engineering (according to MOEC)
  - Establish new disciplines of GNSS, Celestial mechanics and satellite orbit, Combined navigation, LBS, Integrated PNT

- Aim to BDS/GNSS development and applications
  - Construction, operation and maintenance of constellation
  - Applications of BDS/GNSS includes interoperation
  - Promotion and governance of BDS/GNSS industry
Scholarship education...

- **Mechanism for international personnel**
  - English language for Textbooks, lectures
  - Mixed classes for international students and Chinese students
    - International and domestic students about 3:1
  - Bilateral recognition of scores, scholarship
  - Appointment of international scientists to give lectures, to be tutors

- **Strengthen practice of Innovation and Entrepreneurship**
  - Testbed of BDS/GNSS, GBAS, SBAS, LBS to understand relevant platforms
  - Joint lab with companies to test knowledge and BDS/GNSS products
  - Regular competition of Innovation and Entrepreneurship in Beihang University
Scholarship education......

- Enrollment of kinds of students from domestic and abroad
  - Graduate students for Master and Doctor degree start from 2018
  - Scale of students will reach 300 till 2022
  - Enrollment of undergraduate students will start by 2022

- Distance video education for remote area classes or abroad students

- Heighten and keep higher quality of graduate education
  - Adopt international evaluation standards
  - Fulfill two tutors mechanism gradually: one from China vs one from abroad
  - Enhance test weighty of Innovation capability
New mechanism of education

International cooperation among co-construction partners besides normal academic education

- Exchange of Teachers
- Exchange of Students
- Joint teaching
- Summer School
- Thematic training
- Training in abroad
Training Courses

- Important issues for B2ROS to implement frequently
- Support training courses in China and in abroad
- Network and database of global experts and companies to guarantee excellent training events
- Systematic training textbooks, test facilities, support material, normalized procedure
- Trainees database and revisit mechanism, support trainees work in BDS/GNSS afterwards and long-term
Training courses in Thailand
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
Cooperation

- Training of Human resources
- Technology support
- Based on CORS, support to construct processing center, operation center and operate by partner
- Manufacture of devices
- Establishment of application systems
- Joint venture between two sides if agreed
BDS Ground PPS in China

National GNSS CORS

HUBEI
SICHUAN
GUANGDONG
XINJIANG REGION

Courtesy Shi Chuang
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
BDS-3 is being constructed, will provide high-accuracy positioning, navigation and timing services to global users in all-time, all-weather conditions.

Crucial support and demand from: BeiDou Global Navigation Satellite System

The 1st Step: 1994 ~ 2000, provide regional active services

The 2nd Step: 2004 ~ 2012, provide regional passive services

The 3rd Step: 2013 ~ 2020, provide global passive services
Beihang University is top university in aerospace and astronautics in China.

<table>
<thead>
<tr>
<th>No.</th>
<th>First level disciplines</th>
<th>Ranking (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S&amp;T of Aerospace and Astronautics</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>S&amp;T of Instruments</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Computer S&amp;T</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Software engineering</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Control Science and Engineering</td>
<td>4</td>
</tr>
</tbody>
</table>
BeiDou International Exchange and Training center (BDIETC) founded in Beihang University on 24 August 2012, approved by BeiDou Satellite Navigation Engineering Center

BDIETC provided excellent base for B2ROS
Training events in Beihang University

- BDIETC established a set of courses system for graduate students,
- BDIETC trained about 80 Degree scholarship persons for more 10 countries in Asia and Pacific region
  - Included 60 Masters and 18 Doctors
- BDIETC have held more than 14 short term training courses, favoured more than 600 trainees from more than 40 countries during past 4 years
- BDIETC have also been to 10 countries to open training courses for local trainees
- Adapted to the development of BDS-3, target of more than 150 trainees is being studied. School is needed to match this requirement
# Scholarship education

**Master degree**

## Phase I 第一阶段
Course Study in China: 9 months (in BUAA) 九个月的课程学习（北航）
(Leading to Course completion Certificate of BUAA) (获得课程结业证书)

<table>
<thead>
<tr>
<th>Module I</th>
<th>Module II</th>
<th>Module III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Platform Courses (all Directions) 公共平台课程</td>
<td>● Major courses 专业课程</td>
<td>● Pilot Project 实践课程</td>
</tr>
<tr>
<td></td>
<td>● Academic Lectures 讲座</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Professional visits 专业参观</td>
<td></td>
</tr>
</tbody>
</table>

## Phase II 第二阶段
Thesis Research: 12 month (in China or home country) 论文研究 12个月（中国或学员本国）
(Leading to Master’s Degree in Engineering) (获得工学硕士学位)
<table>
<thead>
<tr>
<th>Core Course</th>
<th>Class Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNSS Reference System</td>
<td>18</td>
</tr>
<tr>
<td>Principle of Global Navigation Satellite Systems</td>
<td>32</td>
</tr>
<tr>
<td>GNSS Navigation Signal</td>
<td>18</td>
</tr>
<tr>
<td>GNSS Receiver Principles and Design</td>
<td>32</td>
</tr>
<tr>
<td>GNSS/INS Integration Navigation</td>
<td>32</td>
</tr>
<tr>
<td>Global Satellite Navigation System Applications</td>
<td>18</td>
</tr>
<tr>
<td>Satellite Navigation Data Processing</td>
<td>32</td>
</tr>
<tr>
<td>GNSS Experiment</td>
<td>18</td>
</tr>
<tr>
<td>GNSS New Technologies</td>
<td>18</td>
</tr>
</tbody>
</table>
Textbooks of BDS/GNSS

GNSS Master degree

GNSS training courses
Facilities for education and training

BeiDou Satellite Navigation System
Exhibition Hall (Located at Beihang Aerospace Museum)
1. Introduction
2. Architecture of B2ROS
3. Academic education and training
4. S&T cooperation and BDS localization
5. Solid basis in Beihang University
6. Summary
Summary

- B2ROS focus on scholarship education, training, R&D for awareness and applications of BDS in the world esp. along the Belt and Road
- B2ROS have good facilities to succeed education and training target, and heighten itself together with construction and applications of BDS-3
- B2ROS are willing to collaborate with international partners to implement education, training, R&D, applications in domestic and abroad
- Support and co-construct Beidou Belt and Road School with Beihang University are appreciated
Thanks for your attention!

Dr. Guifei Jing
BeiDou Belt&Road School, Beihang Univ.
Email: guifeijing@buaa.edu.cn