Partnerships for International Research & Education in South Korea

Dr. Eng. Abolghasem Sadeghi-Niaraki

아볼가셈

K.N. Toosi University of Technology
Iranian Vice-Presidency for Science & Technology
December 13th 2018

a.sadeqi313@gmail.com
## Contents

- **Section 1 | Internationalization of Higher Education South Korea**
  - About South Korea
  - IHE: Promotion, Implementation and Improvement Strategies in Korea
  - Korean universities
  - Creative Economy/Creative Education/Creative university

- **Section 2 | Intl R&E Partnerships case studies in Korea**
  - UST
  - CT Dual Program
  - ABEEK
  - Korean institutional level cooperation
Section 1 | Internationalization of Higher Education South Korea

- About South Korea
- IHE: Promotion, Implementation and Improvement Strategies in Korea
- Korean universities
- Creative Economy/Creative Education/Creative university
About South Korea
Korea at a Glance

- Population: 50,220,000
- Capital City: Seoul
- GDP per capital: USD 27,195
- Unemployment rate: 4.50%
- Official language: Korean
- Currency: USD 1.00 = KRW 1,149
- Corporate tax rate: 24%
- Personal income tax rate: ~ 38%
- Main export: Electronic equipment, machinery, Vehicles, Ships, Medical equipment, and tools
- Major Trade Partners: China, USA, Japan, and etc.
- Labor force participate rate: 63%
## International Ranking of Korea

<table>
<thead>
<tr>
<th>KOREA</th>
<th>World Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 GDP</td>
<td>11&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>2015 GDP per capita</td>
<td>28&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>2015 Export</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>2016 IMD World Competitiveness</td>
<td>29&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Science Infrastructure</td>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Technology Infrastructure</td>
<td>15&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>2016 Global Manufacturing Competitiveness</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>2015 The Bloomberg Innovation Index</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>2016 WIPO Global Innovation Index</td>
<td>11&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
The ICT Development Index (IDI) is an index published by the United Nations International Telecommunication Union based on internationally agreed information and communication technologies (ICT) indicators.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Korea</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Iceland</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Norway</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Netherlands</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Finland</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Hong Kong, Chi</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>6</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>
Growth of Korea ICT Sector

1970

1.3 Million US$ (0.01% of GDP)

Production

2015

382 Billion US$ (8% of GDP)

- Hardware......74% (Display Panel, Semiconductors, Mobile Phones, Others)
- ICT Service.............16%
- Software...................10%

Employment 9.8%

Export

5 Million US$

173 Billion US$ (30.3%)

- ICT Companies
  3,789 (1986) ➔ 23,504

Growth of Korea ICT Sector

Sadeghi-Niaraki
Korea’s ICT exports status

* Top ICT exporters (2013): China (1st), U.S.A. (2nd), Germany (3rd), Korea (4th)

Three leading ICT products

- **Mobile Phone**
  - Source: SA

- **DRAM**
  - Source: iSuppli

- **LCD Panel**
  - Source: DisplaySearch
Role for success

- Policy / Regulation
- Fund for R&D/HR

- Human Resource
- Basic Research

- R&D
- Standardization

- Market
- Product/Service
Technology Policy in Korea

70–80s
Substitute industry-based technology imports
Develop universally-needed technologies
Build core equipment
Technology acquisition from FDI

Early 1990s
Develop core industrial technologies
Mid-term tech. development
Core platform technologies
Early domestic R&D

Late 1990s
Promote Venture startups
Parts & materials technologies
Next-generation new technologies
TD program and TTC initiative

Early 2000s
Strengthen technology transfer and Commercialization
Growth engine technologies
Regional industrial technologies
Holistic approach by TTC stages

Since 2010
Seek open innovation
Internationalize R&D
Technology financing
R&D-specialized companies
Promote MOT
TTC policy aimed for global market
ICT Policy History in Korea

ICT Policies (Informatization + Industrialization)

- **1978-1987**: Computerization of Public Administration
- **1987-1996**: National Backbone Network
- **1996-2000**: National Informatization (Integration)
- **1999-2002**: “Cyber Korea 21”
- **2002-2006**: “e-Korea”
- **2003-2007**: “Broadband IT Korea”
- **2006-2010**: “u-Korea”
- **2008-2011**: New National Informatization (IT Convergence, Green IT, Smart Work)
- **2010-2014**: “Smart Korea”
- **2015-2020**: “K-ICT Strategy”

Construction of a Creative Knowledge-based Nation

Vision

- Increasing the share of the knowledge-based industries in GDP up to the OECD countries’ by 2002
- Becoming one of the top ten advanced knowledge-based information societies in the world by the year 2002s

Goal

Strategy

- Establishing the Information Infrastructure
- Improving National Productivity
- Creating New Business & Facilitating IT Industry
U-Korea Policy (2006-2010)

Advanced Korea

Realizing the world’s FIRST u-Society based on the world’s BEST u-infrastructure

Advancement of Five Areas

- Friendly Government
- Intelligent Land
- Regenerative Economy
- Secure & Safe Social Environment
- Tailored u-Life Service

Optimization of Four Engines

- Balanced Global Leadership
- Ecological Industrial Infra
- Streamlining Social Infra
- Transparent Technological Infra
Smart Korea Policy (2010-2014)

Achieving a Digital Creative Korea for Citizens’ Happiness

Vision

Goal

Strategy

Creative Economy

Optimized Society via ICT

Renewed Human Capacity

Enhanced ICT Infrastructure

Dynamic Economy

Good and Worryless Citizen Life

Digital Environment Allowing Co-existence in Trust

Smart Korea Policy (2010-2014)
IHE: Promotion, Implementation and Improvement Strategies in Korea
Despite the fact that the world is now a global village and people can interact with one another with the help of info./comm tech.

- there is still the need for them to move across geographical boundaries in search of knowledge.
Directly experience the culture and context of that area.

The movement of these people across geographical boundaries is just one aspect of intl.

Int’lizn could be achieved via

- Collaboration between schools,
- Dual degree program
- Improving the curriculum
- Exchange program
IHE in South Korea

- Int’lizn is an integral part of mainstream higher education policies and programmes in Korea

- It is increasingly perceived as a key tool for improving the quality of higher education
Some challenges

- Establishing an effective quality assurance mechanism for cross-border educational activities;
- Redressing the government’s previous, overriding emphasis on the quantitative aspects of Int’lizn, at the expense of quality;
- Maintaining a balance between the conflicting demands of competition and cooperation with other countries
IHE in Korea

- Trade liberalisation
- Quality assurance
- Brain drain/gain
- Contributions of stakeholders
  - Government agencies,
  - Universities
  - Industries
In Korea (NIIED2014)

- 376 official Higher Education institutions that support 3.7 million students and 60,000+ academic staff.
  - 179 private four-year universities,
  - 43 national universities, polytechnics, cyber-universities and other types.
  - Two-year and three-year Junior colleges number 149, with a student population of 770,000 and 12,500 faculty.

- In 1970 there were 160 higher education institutions serving about 200,000 students.
Globalisation defined as the changes of the society, the formation of a society of information, ways of mobility, integration of markets and also political, economic and socio-cultural changes.

Int’lizn is the integration of international, intercultural, and global dimension into the purpose, function, and delivery of higher education.

So= Int’lizn is the **vehicle** by which globalisation is realised.
Korean Policy (cooperation and competition)

- Allowing for collaborative curriculums between Korean and foreign universities beginning in 1997
- Permitting foreign Higher Education Institutions to set up branch campuses in Korea starting in 1998, while keeping the existing domestic regulatory framework largely unchanged;
- Considering further deregulation to attract more foreign branch campuses after 1999
Brain Pool Programme (1993)

- Attracting renowned foreign scientists/engineers and Korean scientists/engineers residing overseas
- Enhance the Research and Development level of Korea
- Contribute to achieving the national policy goal of joining the advanced Science and Technology countries
- By 2013 with 1578 research institutions.
  - 749 universities, 658 National /Public Research institutions, 92 corporate Research institutions, 53 Government funded Research institutions and 26 Non Profit Foundations institutions.
  - 333 USA, 329 from India, 278 from China, 136 from Russia and 502 from the rest of the world
Korean Higher Education had received influence from both the Japanese and Western Educational System.

- Previously KHE in public sector was Japanese oriented
- Previously KHE in private sector was Western (USA) oriented
- Now both KHE influenced by USA!
Korea in Education

- 9th world economic power and the 15th in terms of Education (2014)
- KHE leader in OECD countries
Korea has an advantage in influencing higher education but because of language and cultural barrier, the influence is not being felt.

It is rather unfortunate that most Universities in Korea use only 33% using English as the language of instruction.
At the educational system level, two major parties

- National Institute of International Education (NIIED)
- KOICA (Korea International Cooperation Agency)
Global Korean Scholarships (GKS)

- Korean Government Scholarship Program (KGSP)
- Korean Government Support Program for Foreign Exchange Students (MOUs between universities)
- Support Program for Self-financed Students
- Short-term training for Undergraduate Students from Major Countries (invite excellent foreign students)
- Government Scholarship Overseas Study
Junior colleges (2~3 year program)

Universities (4-year program)

Graduate schools

Cyber universities
Four Types of Korean Universities

Normative match, resource dependency and the implementation of internationalization strategies.

- **Private/Metropolitan:**
  - Korea University (KU)

- **Public/Metropolitan:**
  - Seoul National University (SNU)

- **Private/Regional:**
  - Keimyung University (KMU)

- **Public/Regional:**
  - Kyungpook National University (KNU)
Korean Ministry of Education revised its key policies in 2014.
The background to these changes included recognition of continuous changes in the global education environment can be viewed as a clear response to the government’s ambition to develop Korea as a “Creative Economy”.
The policies emphasize the importance of the following aspects of education:

- Development of character and creativity;
- Responding to population and society changes;
- Developing capacity to address global issues like climate change.

Public expectations of education were also recognised, with emphasis on the importance of:

- Happy education and humanistic education;
- Demand for structural reform of the university system;
- Addressing a perceived mismatch between education and social demand;
- Demand for reduction of private education costs.
Key Strategies:

- **Dreams and Talents:**
  - Happy school education, fostering students’ dreams and talents

- **Creativity:**
  - High quality universities cultivating creative and talented people

- **Challenge:**
  - Competency-based society where challengers can succeed

- **Hope:**
  - Open opportunities for fulfilling people’s hope
Emerging trends

Korea’s drive for a “Creative Economy”:
- Government policy on innovation and education has focused on the vision for a “Creative Economy” as support of “Creative University”

Internationalisation and restructuring of Korean Higher Education:
- focused on increasing the internationalisation of Korean institutions, with a particular emphasis on improving higher education quality and attracting international students in larger numbers.
Public R&D Planning (structure of Public R&D System)

- NSTC (National Science & Technology Council)
  - OSP (Office of Science Policy)
    - Ministry of Trade, Industry and Energy
    - Ministry of Science, ICT and Future Planning
    - Ministry of Culture, Sports and Tourism
  - Others

(Research Institutes under Research Councils, Private Companies, Universities, etc.)

Policy Maker

Government

Industry (Technology Transfer)

Academy

Planning

Budget Agency

Main Body Of R&D

User

Sadeghi-Niaraki
# Government R&D Institutes

<table>
<thead>
<tr>
<th>Institutes</th>
<th>NST</th>
<th>NRC</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Institutes</td>
<td>26 Institute</td>
<td>51 Institutes</td>
<td></td>
</tr>
<tr>
<td>₩ 4,719,279 m Budget</td>
<td>₩ 988,289 m Budget</td>
<td>₩ 5,707,568 m Budget</td>
<td></td>
</tr>
<tr>
<td>11,617 Researchers</td>
<td>5,596 Researchers</td>
<td>17,213 Researchers</td>
<td></td>
</tr>
<tr>
<td>6,055 Patents</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 2 | Intl R&E Partnerships case studies in Korea

- UST
- CT Dual Program
- ABEEK
- Korean institutional level cooperation
Abolghasem

ITS2017

Computer Experts

GIS Experts

Electronic Experts

IT experts

Govermental and private projects

Mechanical Experts
Global Leading, Asian Best GFRI University

Vision

Goals

- World Best Educational Competitiveness
  - Excellent UST

- Industry-Academia-Research Integration
  - Entrepreneur UST

- Global Reputation as NRL based Graduate School
  - Global UST

- Creative Knowledge Management
  - Smart UST

Strategies

- Life-cycle Education
- Industry-oriented Professionals
- Improve Brand Value
- Cutting-edge Educational Environment

- Differentiated Education System
- Industry-Academia-Research Partnership
- Cooperation Network
- Management Efficiency

Core Values

- Creativity
- Challenge
- Convergence
- Credibility
First Step (2012~2015)

- UST global positioning
- Establish differentiated education system
- Build cutting edge infrastructure

Takeoff Stage

Second Step (2016~2020)

- Invigorate global partnership
- Change from Quantitative growth to qualitative development

Growing Stage

Third Step (2021~2025)

- Contribute to the development of the government-contributed research institutes
- Establish new educational model

Leading Stage
(Culture Technology)
Culture Technology

Eco Technology

Nano Technology

Space Technology

Bio Technology

Culture Technology

Information Technology

6T
Core Technologies for the National Advancement (to the $30K GDP) (2001)

- IT, BT, NT, ET, … and … CT
KAIST Ranking

TOP UNIVERSITIES Rankings

Rank 51 in World University Rankings 2014/15

Rank 3 in QS University Rankings: Top 50 Under 50 2014/15

Rank 3 in Asian University Rankings 2015/16
ABEEK
Accreditation Board for Engineering Education of Korea
The Accreditation Board for Engineering Education of Korea (ABEEK) was founded as a non-profit, independent organization on August 30, 1999.

ABEEK aims to promote the development of engineering education and produce qualified engineers by providing the accreditation of college educational programs in engineering and related fields and the consultation through the criteria and guidelines suggested for those programs.

Their vision is to provide an accreditation and consultation system to stimulate the innovation of engineering education in Korea so that a vast majority of engineering students are able to be qualified on the global standards.

The accreditation procedure takes approximately 20 months from the announcement.

The regulations of the accreditation procedure are defined by the articles and rules of the accreditation procedure.

The accreditation process is divided into three phases:
- Preparation,
- Evaluation
- Decision-making.
The three characteristics of ABEEK

- **Demand-driven education**
  : reflecting needs of students, industries and society.

- **Outcomes-based education**
  : setting measurable objective and measurement/analysis of achievement (Program educational objectives and learning outcomes, course learning outcomes)

- **Continuous quality improvement (CQI)**
  : quality management on educational process and methods
ABEEK Program Overview

1st yr Curriculum
- Core Electives
- MSC
- Core

2nd yr Curriculum
- Core Electives
- MSC
- Major (Intro. Design)
- Core

3rd yr Curriculum
- Core Electives
- Major (General Design)
- Core

4th yr Curriculum
- Major (Capstone Design)
- Core

- Ability & Qualification Required Upon Graduation
- Program Outcome (1)
- Program Outcome (2)
- Program Outcome (12)

1yr Interval

PO Assessment & Analysis

2014 공학교육인증 소개

3yr Interval

Needs of Participants
Reflected

CQI

Assessment on
- Edu. Obj. Achievement
- Appropriateness of PO Eval. System

Participants
- Faculty
- Current Students
- Alumni
- Industry

PEO

Program Educational Objective

University/College Educational Obj.

Program Outcome

54/20
The Program must ensure that its students attain the following outcomes by the time of graduation.

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Hard Skill</th>
<th>Soft Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 an ability to apply knowledge of mathematics, basic science, engineering, and information technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 an ability design and conduct experiments, as well as to analyze and interpret data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03 an ability to devise a system, component, or process to meet desired needs within realistic constraints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04 an ability to identify, formulate, and solve engineering problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05 an ability to use techniques, skills, and engineering tools necessary for engineering practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06 an ability to function in multi-disciplinary teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td>07 an ability to communicate effectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08 a recognition of the need for, and an ability to engage in life-long learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09 a broad understanding of the impact of engineering solutions in economic, environmental, and societal context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 a knowledge of contemporary issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 an understanding of professional and ethical responsibilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 an understanding of other cultures and an ability to engage in international cooperation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Korean Research institutes level cooperation for commercialization
## Vision & Strategy

### ICT Innovator for a Great Tomorrow

#### Management Goal

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Patent</th>
<th>HR Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation R&amp;D Outcome&lt;br&gt;  - World-best tech: 8&lt;br&gt;  - Essential/basic tech: 35</td>
<td>Global IP Competitiveness&lt;br&gt;  - Royalty: US$50 million&lt;br&gt;  - Standard Essential Patents: 500</td>
<td>World-best HR Management&lt;br&gt;  - Global Talent: 10%&lt;br&gt;  - Neo-culture</td>
</tr>
</tbody>
</table>

#### Strategic Goal

```
“ The customer has the answer ”
```

|---------------------------------------|----------------------------|----------------------------------------|----------------------------------------|-----------------------------|
2. Operation Status

Board of Directors

President

Audit

Creative Future Research Laboratory

IT Convergence Technology Research Laboratory

Software & Content Research Laboratory

Information & Communication Core Technology Research Laboratory

Broadcasting & Telecommunications Media Research Laboratory

Communication & Internet Research Laboratory

National Security Research Institute

Audit & Inspection Department

Creative & Challenging Research Division

Strategy & Planning Division

Technology Commercialization Division

Management Division

Public & Relation Management Department

ETRI Beijing R&D Center

ETRI USA R&D Center
1. Continuous Creation & Expansion of New ICT Markets

Economic Effect
104.6 billion USD (accumulative)

- TDX
- DRAM
- CDMA
- WiBro Terrestrial DMB
- 4G (LTE, WiBro ADV)
- Digital Actor
- Flexible Display
- Flexible Solar Cell
- Silicon Photonics
- Dog-Horse Robot
- MIT Device
- Bio-Shirt
- Emotion Robot “Kobie”
- SAN-based Remote Maintenance Ship Device
- Virtual e-learning System
Major Achievements

ETRI ranked for three consecutive years, No.1 in the World (237 institutions)

INNOVATION ANCHOR SCORECARD™ BY IPIQ
Korea’s Electronics & Telecommunications Research Institute leads the initial ranking

The iPIQ Scorecard Ranks ETRI #1 in Second Innovation Anchor Scorecard™
Top 10 Institutions in Innovation Anchor Scorecard™ | Annual snapshot
(Industry Impact™ and Research Intensity™ indicators are both normalized to 1.0 for the industry average.)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Technology Strength</th>
<th>Patents Granted</th>
<th>Science Strength</th>
<th>Innovation Cycle Time</th>
<th>Industry Impact</th>
<th>Research Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electronics &amp; Telecommunications Research Inst.</td>
<td>531.57</td>
<td>683</td>
<td>30</td>
<td>7</td>
<td>0.94</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>MIT/Mass Inst of Technology</td>
<td>519.53</td>
<td>301</td>
<td>17826</td>
<td>12</td>
<td>2.71</td>
<td>1.72</td>
</tr>
<tr>
<td>3</td>
<td>University of California</td>
<td>439.08</td>
<td>455</td>
<td>18091</td>
<td>12.1</td>
<td>1.52</td>
<td>1.22</td>
</tr>
<tr>
<td>4</td>
<td>Stanford University</td>
<td>630.93</td>
<td>720</td>
<td>301</td>
<td>12.9</td>
<td>2.46</td>
<td>1.44</td>
</tr>
<tr>
<td>5</td>
<td>California Inst of Technology</td>
<td>188.45</td>
<td>151</td>
<td>9027</td>
<td>13.5</td>
<td>1.96</td>
<td>1.71</td>
</tr>
<tr>
<td>6</td>
<td>Columbia University</td>
<td>168.3</td>
<td>109</td>
<td>9327</td>
<td>12.1</td>
<td>2.41</td>
<td>2.25</td>
</tr>
<tr>
<td>7</td>
<td>University of Illinois</td>
<td>153.16</td>
<td>103</td>
<td>17832</td>
<td>11.6</td>
<td>2.34</td>
<td>2.07</td>
</tr>
<tr>
<td>8</td>
<td>Nanyang Technological University</td>
<td>151.73</td>
<td>120</td>
<td>1023</td>
<td>11.9</td>
<td>2.14</td>
<td>1.93</td>
</tr>
<tr>
<td>9</td>
<td>Oregon State University</td>
<td>144.82</td>
<td>99</td>
<td>9768</td>
<td>12.0</td>
<td>2.31</td>
<td>2.12</td>
</tr>
<tr>
<td>10</td>
<td>University of Michigan</td>
<td>143.66</td>
<td>100</td>
<td>1011</td>
<td>11.8</td>
<td>2.30</td>
<td>2.11</td>
</tr>
</tbody>
</table>

INTELLECTUAL PROPERTY TODAY  APRIL, 2013
## 2. Technology Portfolio

### Internet Technology
- **5G**
- **4G – LTE** (600Mbps/40MHZ)
- **4G – WiBro** (400Mps/40MHz)
- **Internet of Things (IoT)**
- **Trusted IP Networking (TIPN)**
- **Smart Mobile pairing technology**

### Software / Security Technology
- **Big Data** (Monitoring and projecting issues on social media)
- Korean/English Portable automatic interpretation technology
- Cloud Storage SW
- Skin Patch Wearable Computer
- Smart Phone Security

### Telecommunication / Broadcasting Technology
- **3D TV** (non-glass)
- **4KUHD TV**
- **Holography**
- Smart TV + +
- GPS Jamming Detecting System

### Convergence Technology
- Digital Ship/ Vehicle Solution
- **u-health care** (Bio sensor-cancer, cardiac Infarction)
- RFID/USN (u-City Sensor network, RTLS Tag)
- Smart Green Home

### Digital Contents Technology
- Game/3D (Game Service platform)
- Virtual Reality (Simulator for metal and modeling)
- Interactive Live 4D/ & UI/UX
- Interactive 3D Educational Program

### Components & Material Technology
- **NG Display** (flexible display, transparent display, Electronic paper, OLED, LASA)
- GaN Module (Raider)
- Photonic/Wireless Components, NT
- Green Devices & Materials (Solar, Terahertz wave)
فعالیت‌های مربوط به عضویت ایران در شبکه IVI
Conclusions:

Iranian Uni  Cooper/compet  Korean Univ.  Iran

Industry/commerlized  

Iranian Uni  Partnership  Korean Com.

Industry/commerlized  

Iranian Uni  

Korean uni
Q & A

a.sadeqi313@gmail.com
감사합니다