APPLICATION FORM (JOINT RESEARCH)
HIGH POTENTIAL INDIVIDUALS GLOBAL TRAINING PROGRAM)

AGREEMENT

As stated above, I submit this application form to IITP that conducts "High Potential Individuals Global Training Program" supported by Ministry of Science, ICT in South Korea. IITP may disclose the information below to the public for the purpose of providing information and matching a research partnership between your institute and a Korean university.

* IITP : Institute for Information & communications Technology Planning & Evaluation

Printed Name of Chief of Research	Taesic Kim	Date(mm-dd-yyyy)	02/14/2020
Signature of Chief of Research	*Taesic Kim*		

☞ *(Note) This application is to identify the willingness to participate in this research and to find a research partnership for research institutes in Korea. Therefore, in its sole discretion, it is acceptable to contain only minimal information. (max. 3 pages)*

1. Research Title	Development of a Big Data Platform for Smart Grid Cybersecurity						
2. Research Area	**A.I.**	**Big Data**	**Cloud Computing**	**Block Chain**	**AR/ VR**	**ICT/SW Convergence**	**Other ICT /SW**
	X	X	X				

3. Chief of research	Title	Assistant Professor	Contact	E-mail : taesic.kim@tamuk.edu
	Name	Taesic Kim		Tel : +1-361-593-4851

4. Affiliation	Name	Texas A&M University-Kingsville	Classification	(X) University ( ) Research Institute ( ) Industry ( ) ETC.

5. Capacity for students (5 or less)	3	Support for students *(all necessary)*	(X) Visa support (X) Research Mentoring (X) Research Space (X) Accessibility to Research equipment

6. Research Objective	The goal of this project is to study a new framework of a cloud-based Big Data platform for smart grid applications, which can not only open a new platform to improve grid monitoring, control, infrastructure protection, but also improve cybersecurity. The research objectives include the following: -Objective 1. Design a cloud-based Big Data platform for smart grids -Objective 2. Develop an AI-based intrusion detection
7. Research Summary	- Objective 1. Design a cloud-based Big Data platform for smart grids: Emerging Big data (BD) technology has a potential to unlock novel breakthrough for modernizing current electrical power grids (i.e., smart grids) for grid monitoring, control and infrastructure protection. For example, the American Recovery and Reinvestment Act (ARRA) of 2009 allocated over $4 billion dollars to deployment of new Big Data technology which leveraged a remarkable proliferation of the use of Big Data across multiple operational domains such as generation, transmission and distribution, customers, services, and markets. However, standard big data architectures for power grids have not yet been developed. The goal of Objective 1 is to design a cloud-based Big Data architecture for smart grids. The proposed cloud platform will have four distinct layers: 1) data sources and ingestion, 2) data management, 3) data analytics, and 4) user-friendly visualization. If successful, the proposed Big Data cloud platform will enable a new level of intelligence and cost-effective big data analytics architecture for numerous smart grid applications. -Objective 2. Develop an AI-based intrusion detection: The ever-growing threat of sophisticated cyber-attacks on our nation's electric grid and other critical power infrastructures poses a serious challenge. Cyber security of the power grid, encompassing attack prevention, detection, mitigation, and resilience, is a critical research priority. Consequently, this thrust will focus on the development of a cyber-physical system framework for risk modeling and mitigation of cyber-attacks on the power grid such as false data injection attacks. However, most of the existing power system were not designed by accounting cyber-security. The goal of Objective 2 is to develop an AI-based intrusion detection algorithm using the proposed cloud-based bigdata platform. Our working hypothesis is that integration of Big Data analytics will provide an excellent opportunity to timely identify such malicious attacks and prevent the power system from huge damages. Specially, we will investigate a false data injection attack detection by using AI-based predictors to effectively prevent the attacks.
8. Need for funding from Korean government	80,000,000 Won
9. Request for Korean Universities	- The selection of students studying abroad should be conducted after mutual consultation, and please cooperate as much as possible to prepare for VISA.