



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

AGREEMENT			
<p>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.</p> <p>* IITP : Institute for Information &amp; communications Technology Planning &amp; Evaluation</p>			
Printed Name of Chief of Research	Edward Kim	Date(mm-dd-yyyy)	02-14-2020
Signature of Chief of Research	_____		_____
<p><i><b>(Note)</b> 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)</i></p>			

<b>1. Research Title</b>	Sparse Associative Deep Learning						
<b>2. Research Area</b>	<b>A.I.</b>	<b>Big Data</b>	<b>Cloud Computing</b>	<b>Block Chain</b>	<b>AR/VR</b>	<b>ICT/SW Convergence</b>	<b>Other ICT /SW</b>
	<b>X</b>						
<b>3. Chief of research</b>	Title	Associate Professor		Contact	E-mail : ek826@drexel.edu		
	Name	Edward Kim			Tel : +1-215-895-0532		
<b>4. Affiliation</b>	Name	Drexel University		Classifi- cation	<input checked="" type="checkbox"/> University <input type="checkbox"/> Research Institute <input type="checkbox"/> Industry <input type="checkbox"/> ETC.		
<b>5. Capacity for students (5 or less)</b>	1-2		<b>Support for students (all necessary)</b>		<input checked="" type="checkbox"/> Visa support <input checked="" type="checkbox"/> Research Mentoring <input checked="" type="checkbox"/> Research Space <input checked="" type="checkbox"/> Accessibility to Research equipment		



<b>6. Research Objective</b>	<p>We are researching a new paradigm of machine learning, sparse associative deep learning, that is a plausible building block for the next generation of artificial intelligence. Our proposed method addresses many of the major criticisms facing the state-of-the-art deep learning architectures, through the use of biologically inspired concepts. Knowledge gained from this proposed work has the potential to transform how the field creates intelligence in machine learning.</p>
<b>7. Research Summary</b>	<p>We are proposing joint research on new machine learning paradigms that advance current deep learning models. Indeed, deep learning has had incredible success, especially when used in narrow, supervised settings. However, as the machine learning community continually breaks open the black box of deep learning, it is becoming clear that radical new directions in the field of AI need to be explored. Students will work with us on a new method, sparse associative deep learning, inspired by breakthroughs in computational and theoretical neuroscience that incorporate ideas not explored by current feed-forward deep learning architectures. Rather than using massive labeled datasets, the proposed method learns much like an infant learns, i.e. by unsupervised observation and exploration of the world through different sensory inputs. Eventually the model robustly learns the structure of the world, learns heterogenous associations, and even learns how to predict the future. Furthermore, the proposed model mimics the hierarchical architecture, sparsity, top-down, and feedback functions of the mammalian brain. This model is built upon recent advances in neuromorphic software and hardware that enhance the functionality, energy use, and speed of the underlying algorithms. Given that neuromorphic approaches are under active development, the research in this proposal has the unique opportunity to inform future algorithms and functionality in software and silicon. Student's experience in this program will be further enhanced by the PI's collaborations with government, academic, and industry partners.</p>
<b>8. Need for funding from Korean government</b>	<p>The College of Computing and Informatics at Drexel University CCI has state of the art classrooms and research facilities with all of the technology required for effective collaborative environment. The PI has a research lab that provide bright, open coworking spaces for students to work on research projects. Drexel is an R1 Doctoral University, which is the highest class of research activity in the US as recognized by the Carnegie Classification.</p> <p>To provide the best research experience for the visiting students, we are requesting \$23,000 per research student. We believe a smaller cohort of 1-2 students would allow for a more personalized and focused research experience.</p>
<b>9. Request for Korean Universities</b>	<p>The selection of students studying abroad should be conducted after mutual consultation.</p>