3. PURPOSE OF THE COURSE
Refer to each sub-course.

2. TRAINING PROGRAM
(1) General Orientation and Japanese Language Program
The General Orientation and Japanese Program are organized at the Chubu International Centre of JICA prior to the technical training, to assist participants in understanding Japan and adjusting themselves to life in Japan, and thus to facilitate effective training.

(2) Technical Training
Refer to each sub-course. (Total: five sub-courses)

3. NUMBER OF PARTICIPANTS TO BE ENROLLED
5 persons (See each sub-course for details. If each sub-course is filled, some sub-courses may accept second candidates.)
Candidate should be qualified.

4. TRAINING DURATION
From March 5 to October 24, 2018
(1) Arrival in Japan
   March 5, 2018
(2) Briefing
   March 6, 2018
(3) General Orientation
   From March 7 to 9, 2018
(4) Intensive Japanese Language Class
   From March 12 to May 2, 2018
(5) Technical Training
   From May 7 to October 18, 2018
(6) Closing Ceremony (Presentation of Certificate)
   October 19, 2018
(7) Departure from Japan
   October 24, 2018

5. TRAINING INSTITUTION
(1) General Orientation / Japanese Language Program
Chubu International Centre (JICA CHUBU), JICA
4-60-7, Hiraike-cho, Nakamura-ku, Nagoya, 453-0872, Japan
Tel: +81(*)-52(**)-533-0220    Fax: +81(*)-52(**)-564-3751
6. CONDITIONS OF APPLICATION

(1) Applicants should have graduate degree in a certain scientific or engineering educational course of a university or an institute of technology, showing the certified list of subject items with the marks obtained in each subject.

(2) Applicants should have an adequate ability in English conversation to be able to perform satisfactorily in the course. (TOEFL score: more than 490)

(3) Applicants should be good in health, both physically and mentally, to undergo the training; pregnancy is regarded as a disqualifying condition for participation in the training.

(4) Applicants should not be presently serving in the military.

7. APPLICANTS MUST SUBMIT ANNEX WITH THE APPLICATION DOCUMENTS

(1) Applicants should submit the certified list of subject items with the marks obtained in each subject issued by a university or an institute of technology.

(2) Applicants should decide their order of preference 1st ~5th from the following five sub-courses. Once an applicant decides, he/she should write the order of preference in Annex sheet. This will be used only as a reference for the screening committee.

Note: Applicants should be capable enough to pursue any of the sub-courses in order for the training institute to have a wider range of decision on screening. This is why any lack of preferences may result in an unsatisfactory application.

(3) Applicants are required to answer the questions on Annex sheet.
Sub-Course Title: IoT (Internet of Things)

Technology field: IoT(Internet of Things), Computer Vision , Robot Technology, Embedded Technology

Purpose of the Course:
The objective of the training course is to provide the latest available computer techniques for IoT using Computer Vision, Robot Technology and Embedded Software Technology. In this course, the participant design basic and implement the software technology above technology fields.

Course Description:
(1) Basic Training
- Computer Vision: Image formation, Processing, Feature detection and matching, Segmentation
- Robot Technology: Basic Concept, Classification and Structure, Manipulator, Drive and Control
- IoT: MANET(Mobile ad-hoc Network), Data Mining Technology, Cloud Computing

(2) Independent Study under a specific research project theme:
- Computer Vision:
  - Detection of abnormal running vehicle in high-way using high-speed camera
  - Judgment of state of RNA and protein in nucleocytoplasmic transport
  - Detection of vehicle using deformable model and Deep Learning model
- Robot Technology:
  - Robot Hand using EEG, Wheelchair using EEG
  - SLAM(Simultaneous Localization and Mapping) System using new ICP Algorithm.
  - AGV(Auto Guided Vehicle) under severe environments
- IoT(Internet of Things)
  - Environment monitoring system using sensor network
  - Implementation of cloud sensor network system using LowPAN and ZigBee
  - Smart Grid System
  - High Reliability Data Replication System on LoRa

Hardware and software environment
Hardware: Personal Computer (Intel Core i 7), Robots (Robovie, Palro, iRobot and some original robots), High Vision Camera Unit, Mote sensor, Wireless Location sensor (Ekahau), Kinect, Laser Range Scanner, Arduino, Raspberry Pi, Beagle Board, Leap Motion, Zigbee(XBEE), Sensor, LoRA, etc
Computer Software: Microsoft (Developer Network Academic Alliance, Office Enterprise), Adobe (Creative Suite, Flex Builder), Matlab/Simulink, OpenCV, Python (many packaged software)
Sub-course Title: ② Parallel Programming

Technology field: Computer science and engineering

Purpose of the Course:
The participants are expected to learn a fundamental knowledge of parallel computers, parallel programming skills using MPI (Message Passing Interface) and skills for performance evaluation.

Course Description:
Suggested projects include the following steps:
(1) Basic training:
- Fundamental knowledge of parallel computer architecture such as message passing, distributed memory and interconnection network.
- Implementation of a serial program in accordance with your interests or understanding an example of scientific application. C or Fortran is recommended programming language.
- Message passing programming using MPI.
- How to use Linux, if necessary.

(2) Parallelization of your serial program using MPI and performance evaluation of your parallel program. Practice in performance evaluation using parallel efficiency, weak scaling, strong scaling and giving breakdown of execution time.

(3) Improvement of parallel program based on the result of performance evaluation. Discussion about satisfaction of your prerequisite will be welcome.

Hardware Environment: Multi-core computer system and desktop or note PC.
Software tools: MPI, "Totalview" or other tools for performance monitoring.
Required knowledge:
- Basic programming skills in C or Fortran.
- Fundamental knowledge of computer architecture.
Sub-course Title: Embedded Computer Systems Design  
Technology field: Computer engineering

Purpose of the Course:  
The participants are expected to learn design methodologies for embedded computer systems including processor and interface modules to be implemented into FPGAs (field programmable gate arrays) by using a graphical EDA (electronic design automation) tool called “Visual Elite”. The sub-course includes development of application systems such as for IoT.

Course Description:  
Suggested projects include the following steps:
(1) Basic training:
  - Design of functional circuit modules by using logic-gate symbols, truth tables, state-transition charts, and flow charts.
  - Implementation of the functional circuit modules into FPGAs.
  - Assembler-level programming using an original 16-bit processor called “NT-ProcessorV1” and its emulator system.
(2) Development of advanced processor modules providing some accelerator circuits such as binary/decimal multiplier or divider, floating-point adder, and/or parallel pipeline sorting unit, including designs for processor architecture and instruction set.
(3) Development of practical embedded computer systems using the advanced processor modules described above or single board computers usable for such as robot controlling, computer network switching, or IoT systems. Development of an original multi-core processor is also possible.

Hardware Environment:  
Windows-7 or -10 mobile workstation, Raspberry Pi or Arduino single board computers, and network devices.

Software tools:  
Visual Elite and related tools (graphical EDA tools by English).

Required knowledge:  
Basic theory for gate-level logic circuit designs.
Basic software programming by using C language or assembler-level instructions.
Sub-course Title: **Human Computer Interaction**

**Technology field:** HCI, VR/MR, Communication Science, Social Science, Artificial Intelligence

**Purpose of the Course:**
The purpose of this course is to learn the analytical methods for understanding human behavior or communication using social data, and also to learn how to develop the ICT system that help/enhance human communication or human society. The participant is expected to have experiences on the programming and statistical data analysis, and, ideally, deep learning and natural language processing with open source frameworks.

**Course Description:**

1. **Learn Basics**
   - Statistical Data Analysis
   - Natural Language Processing
   - Deep Learning
   - Programming for VR/MR
   - Programming for mobile and web systems

2. **Independent Study under a specific research project theme:**
   - Data analysis of human behavior and its application
     - Analysis of social networking data (e.g. Facebook comments) for improvement human relations in business scene
     - Feature extraction, classification and modeling of music using deep learning for enhancing the creativity of musician
     - Developing the system for measuring teacher-student communication in the classroom using smartphone accelerometer sensors
   - Development of ICT system for helping/enhancing human activity
     - Mobile-based display system of spatial audiovisual contents and web-based design system
     - A disaster simulation by AR system using mobile devices
     - A tangible user interface for self-driven learning environment

   Additional theme may be possible, depending on the needs and skills of the participants.

3. **Hardware and Software environments**
   - **Hardware**
     - PCs with high spec GPU, Oculus rift, Microsoft HoloLens, Communication Robot (Pepper will be available), Drone (DJI Phantom), Omnidirectional camera (Ladybug, Theta), A large number of mobile tablets and smart phones for VR display or human sensing.
   - **Software**
     - Unity, Matlab, and necessary software systems are available if needed.
   - **Programming Language for this course**
   - **Open source frameworks for this course**
     - TensorFlow, Chainer, OpenCV, OpenGL/GLES, WebGL, XAMPP, MySQL.
Sub-Course Title: Secure Communication Techniques for IoT (Internet of Things)

Technology field: IoT (Internet of Things), Network security

Purpose of the Course:
The objective of the training course is to provide the latest communication techniques for IoT using intrusion detection technique and data encryption technique. It is preferable that the participant has some experiences of programming and fundamental knowledge of above-mentioned technologies.

Course Description:
(2) Basic Training
- Data Transmission Technique for IoT Area Network
- Data Communication Protocol

(2) Independent Study under a specific research project theme:
- Network Security:
  - Data Encryption for IoT
  - Device Authentication
  - Network Traffic Monitoring
  - Intrusion Detection
- Embedded Computer System:
  - Development of the evaluation system
  - FPGA programming, embedded software programming

Hardware and software environment

Hardware: Personal Computer (Linux, Windows 7/8/10), IoT devices
Computer Software: Necessary software systems are available if needed.
Japan –Mexico Exchange Program 2017

<table>
<thead>
<tr>
<th>Full Name</th>
<th></th>
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</thead>
</table>
| Where to contact | Tel.  
Fax.  
Email.  |
| TOEFL Score |  |

Please refer to the course information and write your order of first to fifth preference below.

<table>
<thead>
<tr>
<th>Sub-course title</th>
<th>Your order</th>
</tr>
</thead>
<tbody>
<tr>
<td>IoT (Internet of Things)</td>
<td></td>
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<tr>
<td>Parallel Programming</td>
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</tr>
<tr>
<td>Embedded Computer Systems Design</td>
<td></td>
</tr>
<tr>
<td>Human Computer Interaction</td>
<td></td>
</tr>
<tr>
<td>Secure Communication Techniques for IoT (Internet of Things)</td>
<td></td>
</tr>
</tbody>
</table>

Describe the subject of your interest and explain what kind of skill you want to acquire through this course.

Write your work experience

To participate in this course,

☐ I quit my job  ☐ I keep my position at work  ☐ Others (  )

Explain how you would like to use your training experience on your return.

Introduce yourself
You must attach the certified list of subject items with the marks obtained in each subject issued by the university or institute of technology that you graduated from. And please check the documents with the below check list before submitting the documents.

Check List
☐ Application form: Did you fill the all blank? Were there no doubts on your remarks in the document?
☐ Annex: Did you fill out the all blank?
☐ Attachment: Did you attached your certified list of subject items?

Caution: If there is any mistaken in the documents, the applicant will not be accepted in this course.