

3. COMPUTER

1. 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 Osaka International Centre (OSIC) 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: six sub-courses)

3. NUMBER OF PARTICIPANTS TO BE ENROLLED

Minimum: 6 persons (one for each sub-course) / Maximum 8 persons (If each sub-course is filled, some sub-courses may accept second candidates. See each sub-course for details.)

Candidate should be qualified.

4. TRAINING DURATION From March 7, 2011 to December 2, 2011

(1) Arrival in Japan

March 7, 2011

(2) Briefing

March 8, 2011

(3) General Orientation

From March 9, 2011 to March 11, 2011

(4) Japanese Language Program

From March 14, 2011 to May 2, 2011

(5) Technical Training

From May 7, 2011 to November 30, 2011

(6) Departure from Japan

December 2, 2011

5. TRAINING INSTITUTION

(1) General Orientation / Japanese Language Program

Osaka International Centre (OSIC), JICA

25-1, Nishi-Toyokawa-cho, Ibaraki-shi, Osaka, 567-0058, Japan

Tel: +81(*)-72(**)-641-6900 Fax: +81(*)-72(**)-641-6910

URL: <http://www.jica.go.jp/worldmap/english.html#osaka>

(2) Technical Training

Hokuriku Branch Office, JICA

Rifare Bldg (Office Tower) 4F, 1-5-2, Honmachi, Kanazawa-shi, Ishikawa-ken, 920-0853, Japan

Tel: +81(*)-76(**)-233-5931 Fax: +81(*)-76(**)-233-5959

Kanazawa Institute of Technology

7-1, Ohgigaoka, Nonouchi-machi, Ishikawa-gun, Ishikawa-ken, 921-8501, Japan

Tel: +81(*)-76(**)-248-1100

URL: <http://www.kanazawa-it.ac.jp/ekit/>

(*) country code of Japan (**) area code

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 ~6th from the following six 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: Agile Development for Internet Software

(The number of acceptable participant : 1)

Purpose of the Course:

The participant is expected to have an experience on the agile development of Web systems with open source frameworks, and possibly to go in depth, to R&D works for promoting agile programming and to develop new supporting tools.

Course Description:

Designing a prototyped system:

- Example projects in this sub-course so far are as following: *Scheduling management; Photo album; Scholarship application; Customer support; Hospital reservation; Questionnaire survey (J2EE); JICA trainee administration systems; Multi-agent application; Portable Music Kiosk (using Python /TurboGears); Web application (using Ruby on Rails 2.3) and debugging environments.*
- UNIX platforms, such as *Ubuntu* and *Mac OS-X*, are highly recommended.

Programming and debugging

Today's industrial frameworks are for Java:

- Servlets and JSP, otherwise,
- J2EE frameworks (such as JBoss, Struts, Hybernate, etc.)

However, for rapid programming, the following two languages and frameworks, among others such as PHP and Perl, are recommended:

- *Ruby and Rails,*
- *Python and TurboGears (or Django)*

Optionally, following tools and methods are suggested

- TDD (Test Driven Design and unit test),
- Version control system (e.g., SVN, Git)
- Testing by Firefox add-ons: *Selenium IDE*: <http://seleniumhq.org/projects/ide/>, and *Firebug*,
- Our lab originated debugger *Dionea* (see, [sourceforge.net: http://sourceforge.net/projects/dionea/](http://sourceforge.net/projects/dionea/))

Evaluations

The final report should be well formulated from the following viewpoints:

- Intended purpose and achieved result (usage)
- Achievement level
- Project productivity
- Other feedbacks

Sub-course Title: Java Applications on the Internet

(The number of acceptable participant : Maximun2, if all sub-courses are filled.)

Purpose of the Course:

The participants are expected to know fundamental technologies necessary for developing Web applications in a server system and Web applications using the Google Android mobile phone which extensively use the technologies.

Course Description:

[1] The participants learn technologies of Internet system including following concepts.

Web applications in a server system

(1)WWW server: apache-Tomcat

(2)Java, JavaBeans, JSP, XML

(3)Database System

(4)Use of Geographical Information System (GIS) and user's coordinates acquired by GPS on Google maps

Web applications using the Android mobile phone

(5) Android OS

(6) Development of 2D or 3D contents using the Android OS

(7) Implementation of the developed software to the Android mobile phone

[2] After learning the Web + Java and Android programming, the participants design and establish Web applications using the mobile phone.

Hardware and Software Environment:

(1)Workstations: Linux server

(2)Personal computers: Windows XP, Mac and Linux

(3)Computer software

- Apache, Tomcat, Android (Free software)

- Java, C/C++,

- Database (Oracle , MySQL, SQLite)

- GIS system

- Photoshop, Illustrator

Sub-course Title: Embedded Computer Systems Design

(The number of acceptable participant : 1)

Technology field: Computer science and 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 design tool called Visual Elite.

Course Description:

Suggested projects include the following steps:

(1) Basic training:

- Design of functional circuit module 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 module and its emulator system.

(2) Development of advanced processor modules providing some accelerator circuits such as decimal adder, 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 usable for such as robot controlling, computer network switching, or special purpose accelerating general computer systems.

Hardware Environment:

Windows-XP workstations

Software tools:

Visual Elite and related tools (graphical logic systems design tools by English).

Required knowledge:

Basic theory for gate-level logic circuit designs.

Basic software programming for describing flow charts.

Sub-course Title: Advanced Programming Technology

(The number of acceptable participant : Maximun2, if all sub-courses are filled.)

Purpose of the Course:

The purpose of this course is to learn the current advanced computer programming technology.

- (1) Object-Oriented Programming,
- (2) Database Programming,
- (3) Computer-Network Programming,
- (4) Verification of Concurrent/Distributed Programs

Programming skills will be also developed through the course. This course is designed for those who aim at professional programmers.

Course Description:

The participants can choose one or more of the following themes:

- (1) Object-oriented Programming Technology:
Using Java, C++, or Common Lisp (with CLOS), we learn the Object-Oriented Programming.
- (2) Database Programming Technology:
Using Java with JDBC and PostgreSQL/MySQL, we will learn database application development in Java.
- (3) Computer Network Programming Technology:
Using Java and Apache Axis, we will learn how to develop Computer Network Application Software. A special emphasis is placed on security features such as entity authentication. A candidate application is a network system utilizing a time-stamping based on RFC 3161.
- (4) Verification of Concurrent/Distributed Programs:
Using the program verification tool LKSV (Labeled Kripke Structure Verifier) which has been developed in our laboratory, we will learn how to verify concurrent/distributed programs by using the model-checking technology and suitable temporal logics.

The course can be flexibly adjusted to the level of skills of the participants so that they can learn the items easily.

Hardware and Software Environment:

Hardware: Linux and Windows Personal computers, linked to LAN and the Internet.

Software: Java, Axis, Microsoft C++, Allegro Common Lisp, PostgreSQL/MySQL, and the LKSV (Horita Lab's program verification tool).

Sub-Course Title: Visualization Techniques in Computer Graphics

(The number of acceptable participant : 1)

Technology Field: Computer Graphics, Geographic Information System, Remote Sensing, and Web programming.

Purpose of the course:

The objective of the training course is to provide the latest available computer techniques for visualizing our natural and man-made environments. The techniques for building 3D graphics contents in the internet site are learned by this project study. Some examples are as follows:

- Application of geo-visualization techniques for presenting and exploring structures and processes from geospatial data;
- real-time visualization techniques, including modeling of Cars, human bodies, trees in 3D city, texturing for rendering such models;

Course Description:

(1) Learn Basics

- Remote sensing and Geographic Information System (GIS)
- OpenGL or Mesa 3D programming
- Knowledge of GeoElement Library in Visual Studio C++

(2) Independent Study under a specific research project theme:

Some suggested themes:

- Development of an application program for modeling and rendering of 3D city, using GeoElement Library.
- Development of visualizing 3D Earth environment, based on the remote sensing data and GIS.
- Building 3D graphics scenes and animations using Maya 8.0 or 3Ds Max.
- Making of 3D Graphics animation movies using Maya 8.0. or 3Ds Max.
- Development of navigation system using GPS and GIS data.
- Development of internet DB system for GIS and remote sensing images, using apache, PHP (or JSP), and MySQL.
- Analyzing the remotely sensed satellite image data.

Additional theme may be possible, depending on the needs and skills of the student through discussions.

(3) Hardware and Software environments

OS: AIX, Solaris, Linux, Windows XP, OSX

Softwares: Maya 8.0, Maya 8.5, 3Ds Max 7.0 for 3D graphics, IDL 6.3 and Matlab for visualization,

GeoElement for 3D graphics Library for Visual Studio 2005,

Authoring tools: Adobe Premiere Pro, After Effects, Audition, Photoshop, Illustrator,

Open source: Fedora Core, Apache, PHP, Grass for GIS, MySQL for Remote Sensing image DB

Exclusive use of a desktop computer for the project study

Sub-Course Title: Intelligent Robot Control using Computer Vision and Ubiquitous Sensor

(The number of acceptable participant : Maximun2, if all sub-courses are filled.)

Purpose of the Course:

The participant is expected to have fundamental technologies about the Internet and programming skill. In this course, the participant design basic and implement the software technology about intelligent robot.

Course Description:

(1) Map construction and environment recognition by robot

Recently, it has become possible to recognize the environment of the robot by using the image by the advancement of the image processing technique. Especially, the three-dimensional map construction based on the stereo seeing and the multi aspect geometry and the image recognition and the place recognition that uses the amount of the image feature are important technologies for robotics.

Keyword: Position Tracking, Global localization, Bayes filter, Kalman filter, Visual SLAM (Simultaneous Localization and Mapping).

(2) Application of particle filter to object tracking

The particle filter is a technique for presuming the state of the system from the time series of the observation, and it is paid attention in various fields in recent years. In the robot, it is used due to the pursuit problem (position of the object and posture of the object). The application to SLAM is actively researched.

Keyword: Visual tracking, Bayes filter, Monte Carlo method, Bootstrap filter.

(3) Scale-Invariant Feature Transform (SIFT) for pattern recognition

SIFT that is the amount of the local part feature based on the image inclination is a strong mechanism in the rotation, the scale transition, and the illumination change of the object.

Keyword: SIFT, PCA-SIFT, GLOH(Gradient location and orientation), Randomized Trees

(4) Pattern recognition processing for image understanding

It is necessary to use processing of the collation of the image of the background difference and the template match practicably in various environments of the illumination variation and the noise. It is important for us to select an appropriate image feature. Therefore, the technique of detection and the analysis of the moving object are constructed.

Keyword: SRF(Statistic Reach Feature), CHALAC(Cubic Higher order Local Auto-Correlation)

Hardware and software environment

Hardware: Personal Computer (Intel Core i 7), Robot (Robovie R2), High Vision Camera Unit, Mote sensor, Wireless Location sensor (Ekahau)

Computer Software: Microsoft (Developer Network Academic Alliance, Office Enterprise), Adobe (Creative Suite, Flex Builder), CG (Maya Unlimited, 3D Studio MAX), SPSS (Base, Categories, Conjoint, Tables, DataVal, Amos, Clementine), Matlab/Simulink, etc

Japan-Mexico Training Program for the Strategic Global Partnership 2011

Full Name	
Where to contact	Tel. Fax. Email.
TOEFL Score	

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

Sub-course title	Your order
Agile Development for Internet Software	
Java Applications on the Internet	
Embedded Computer Systems Design	
Advanced Programming Technology	
Visualization Techniques in Computer Graphics	
Intelligent Robot Control using Computer Vision	

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, <input type="checkbox"/> I quit my job <input type="checkbox"/> I keep my position at work <input type="checkbox"/> 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.