Instructions of IRH 2017 Study Report

1. Procedure of the study report

The study report is an educational program to learn fundamental robotics and robot design philosophy that must be optimized for the purposes and applied environments.

Procedure of this study report is as follows.

1) Theme selection:

Please select one theme for your study from three themes shown in section 3.

Please reply your selection of the study theme to **secretary@rsj.or.jp** by Friday, October 27, 2017. The theme 1 and the theme 2 have sub-selection from 1) to 3) as shown in section 3. Therefore, if you select theme 1 or 2, please reply a selected sub-selection number too.

2) Pre-study:

Please complete main part of your study report before IRH 2017.

3) Onsite Investigation:

Please investigate real robot technologies concerning your study theme at International Robot Exhibition 2017 (iREX 2017) site on the Day One of IRH 2017.

4) Guide Line of Summarizing Your Study:

Please summarize your pre-study and investigation on iREX 2017 with considering following points.

a) In the pre-study step, please investigate and analyze state of the art concerning the study theme you selected, and please show clearly evidence that derived your study results.

b) Please include new insight that you could get by the real investigation at IRH 2017 site.

c) Please state your opinion that you got from this study.

How present robotics must be improved, how robot systems will be changed by the new robotics, and how our world will be changed by the new robots.

Hint :

For a description of the changing the world, there is a way to discuss changes in the views of the site, the ways how people works, changes in lifestyle, changes in the common sense.

Sample:

If we could get new actuators that can react flexibly against disturbance force and new control technologies that can control the flexible actuators stably

and precisely, we would be able to build up very safety robots against contact between human and robot using the new robotics, and we would be able to realize safety and efficiency collaboration works between human and robot.

5) Presentation:

   Please present your study on the Day Two.

6) Awarding:

   Excellent studies will be honored in the awards ceremony.

   Please refer to "About Awards_English_2017.pdf".

2. Conditions

1) Unit of study and presentation:

   Each school can present just one study report.

2) Presentation time limit:

   Presentation time will be from 10 to 15 minutes. Please consider amount of presentation material to keep time limit. We will decide final presentation time based on participation conditions, and inform you the final presentation time in end of September.

3) Presentation material:

   Please make the presentation material using "Power Point". Format of the presentation materials are free; however, please consider keeping the presentation time limit.

4) Language of the presentation:

   Language of the presentation and its material is English. We will prepare a simultaneous interpreter service between English and Japanese for the presentation.

5) Uploading the presentation data:

   We would be grateful if you could approve our publication of presentation data on the official web site of IRH 2017 after IRH 2017.

   If it is difficult to publish your all or part of presentation data, please consult us.

6) Investigation in iREX 2017:

   Time zone of investigation in iREX 2017 is 10:00 to 17:00 on the Day One. We will prepare a photo license card for your investigation in iREX 2017. Please ask booth staffs before taking picture of robots.

7) Working space:

   You will be able to use the conference room 605 and 606 until 19:00 on the Day One as your working space to finish your presentation material.

8) PCs for presentation and working, digital cameras for investigation:

Please prepare own working and presentation PCs for each school. If your PC doesn't have a VGA terminal, please prepare some signal converting cable for to connect a VGA terminal, because an input terminal type of a projector for presentation will be only VGA.

Please prepare digital cameras that are used for investigation in IREX 2017 for each school too.

We will prepare a monochrome A4 printer and a PC for printing in the conference room 605 and 606 for your working support.

9) Check of projection before the presentation:

Please check connection between your PC and a projector whose input terminal type is VGA at the meeting room on the Day One.

3. Selection of study theme

Theme 1: Systematization of fundamental technologies in industrial robots for manufacturing use

Aim of this theme is to learn fundamental technologies consisting industrial robots.

Please select one category from following three fundamental technologies in industrial robots for manufacturing use.

Please investigate variety of technologies, base principles and etc. included in the selected category, then classify and sort out the investigation results so as to clarify total image of the selected fundamental technology.

< Candidates of category selection>

1) Sensor technologies
2) Mechanical elements; e.g. actuators, reduction gears, structures, mechanisms, materials, and system constructions
3) Robot operating technologies; e.g. safety technologies, and system integration technologies

Theme 2: Relation between applications of robots and their performance

Aim of this theme is to learn design philosophies of robots optimized for its purposes and application environments.

Please select one category from following three robot applications, and investigate relations between robot applications and performances of robots; e.g. special features, functions, structures, constructions, and specifications.

< Candidates of category selection >

1) Manufacturing use; e.g. automobile, electric equipment, electronics components, medicines, cosmetics, foods
2) Service use; e.g. building cleaning, disaster response, infrastructure maintenance, logistics services, security, medical treatment, care for old persons, agriculture, fisheries industry, amusements, guidance
3) Home use; e.g. floor cleaning, security, watch and guard for old persons, interactive home appliances, information terminals

Theme 3: Most advanced technologies of robots

Aim of this theme is to learn most advanced technologies of robots.

Please investigate the most advanced technologies for robots, and explain novelties, and/or usefulness of the technology, then how robots have been improved by the technology.

Technologies have some phases from basic research level to practical use level and there are individual most advanced technologies in the each phase. First of all, please recognize the phase in which your study target belong to. Then please investigate what is the most advanced technology in that phase.

<Hints of study>

For a description of novelty, there is a way to state that it is solved the problems by a method which has not been used so far, the combination of principles, law, methods, individual way, or why there is a way to discuss whether now possible to use the way.

For a description of the usefulness, there is a way to argue that it has the same functionality at a lower cost, implementation of more functions at the same cost, functions which could not be realized until now although it cost more.

For a description of the improvement, there is a way to discuss expansion of the work efficiency by the robot, the effect of reducing the programming time and effort of the robot.