

# Biographical information



Ichiro Kato  
1926-1994

- **1985 B.S., Mechanical Engineering, Waseda University.**  
"Development of articulated manipulator aiming at force control",  
(Supervised by late Prof. I.Kato).
- **1987 M.S., Mechanical Engineering, Waseda University.**  
"Basic theory of multi d.o.f. compliance control on articulated manipulator",  
(Supervised by late Prof. I.Kato).
- **1987-99 Corporate Research & Development Center, Toshiba Corporation.**
  - Research on robots for specialized operations.
  - Developing mechatronics systems using robotic technologies.
- **1998 Ph.D., Mechanical Engineering, Waseda University.**  
"Research on structure and control of working robot in a narrow space",  
(supervised by Prof. S.Sugano).
- **1999-2010 Associated Professor, Shizuoka University.**
  - Education and Research on Bio-Robotics and Human-Mechatronics.
  - Invited Professor (2003). LSC - CNRS, Evry France, Visiting Fellow (2002).  
Shizuoka Industrial Research Institute, Shizuoka Japan, etc.
- **2010- Professor, Waseda University.**
  - Research and Education on Bio-Robotics and Human-Mechatronics.



# Laboratory Introduction

2023.03.24.

## Bio-Robotics and Human-Mechatronics laboratory

Graduate School of Information, Production and Systems, Waseda University

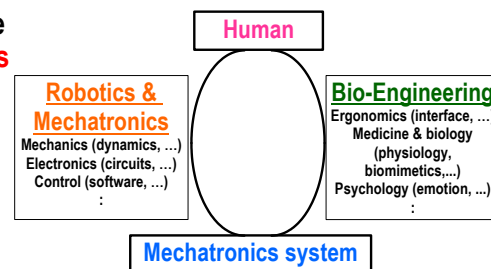
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# Bio-Robotics and Human-Mechatronics Laboratory

- Various subjects between **human** and **mechatronics systems** (robots and other systems).
- To make mechatronic systems more **useful / friendly** for users.
- Developing **original** functions and producing **real-world** systems.
- **Integrating** various knowledge and technologies **into systems** (selection / combination are based on engineering sense).  
→ **System Integrator (Sler).**
- Work on elemental technologies by ourselves if necessary.



**Better interaction / relationship between human and robots**

# Questions

- What is your **purpose** of admission?
  - Tourism in Japan.
  - Earning a degree.
  - Personal growth.
  - Request --- **Change your Mindset.**
    - Passive.  Waiting, Being given, ..
    - Active.  Act, Acquire, ..

## Graduate vs. Undergraduate

- **Graduate school.**
  - **Research.**
  - Unknown issues.
  - Chaotic, Trial and error.
  - Proposal.
    - novelty, uniqueness,
  - Different result.
    - because of you (individuality).
  - No correct answer.
    - make it correct.
- **Undergraduate school.**
  - Learning.
  - Existing facts.
  - Systematized, Formulaic.
  - Memory.
    - certainty, responsiveness,
  - Same result.
    - no matter who does (uniform).
  - A correct answer,
    - always same

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## Research

- <Definition>
  - Reveal something **unknown or new** (in some sense) based not only on the person himself but also based on the accumulation of previous research.
- <Basis of judgment>
  - **Critical** examination of previous research and conventional technology.
- <Resources/accumulation>
  - Emphasis on **facts/theories**,
  - Utilization of **data/theories**.
- <Action/attitude>
  - **Logical/critical** examination,
  - **Hypothesis-testing** examination,
  - **Logical** reasoning,
  - **Critical** analysis.
- <External Attitude>
  - Explanation of the process,
  - Ability of expression and persuasion.
- <Research activities>
  - Cultivation of professionals with a **research mindset** and **research methods**.

## Laboratory

A place for research and learning.

### 1. "Learning Community".

The presence of **seniors** and **peers** in addition to **advisors**.

- A) You can learn as many times as you want.
    - You can listen to explanations and review them many times, and you can have a simulated experience. We look at other people's behavior and correct ourselves.
  - B) Peer review.
    - Critical review by peers (classmates).
  - C) Support.
    - They encourage yourself to study hard together. Train each other to think critically with attention to details.
2. You can learn not only "research **methods**" but also "the significance and value (**goals**) of research" and "the **process** of research refinement".
- The presence of an advisor who conducts research on his own and shows you the "ability to **persevere**" and the **way of thinking**.

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## Activities

- Advises and suggestions in response to proposals and reports:
  - Students need to be active.
  - Things do not progress while waiting for instructions from others.
  - First, think thoroughly and prepare your own answer.
- Lab meetings are the main venue for reporting and discussion.
  - Present and share with all members, learn from each other, and advance.
  - One-on-one individual guidance and support will not be provided.
- Daily activities such as discussion/consultation, mutual learning, and mutual checking among lab members (**persuasiveness**).
  - A training to explain to others and make them to understand and agree.
  - Activities to increase the number of consenters and supporters.
- Skills to report (**expression**)
  - Main points in appropriate few words in a short time.
  - From essential matters,
  - Firstly outline/conclusion, then details such as grounds, causality, and so on.

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# Thesis for a degree

- Master's thesis = Research paper.
  - Both research content (uniqueness/novelty and usefulness/benefit) and expressions with enough information.
  - not an activity report (a list of your actions).
  - To think items (information and grounds) by yourself, and to constantly collect and accumulate them.
- Emphasizing arguments and conclusions.
  - Visualize = Write it down. Use it to organize your thoughts.
  - Actual tasks, evidence information, structure of persuasive logic, etc. required will be different depending on the conclusion to be asserted.
- Guidance (instruction, advice, suggestion) can be given after the information on the grounds for your assertions and conclusions and your persuasive logic are presented.
  - If you think out your claims and conclusions well, you will be improved by the advice and suggestions obtained.
  - Only on the midway progress, no one can discuss to determine whether adequacy/insufficient or pass/fail.
- Ability to persuade.
  - Ability to think about the necessary ground information and collect and record it,
  - Ability to critically analyze the resulting data, etc.
- Approved by professional examination.
  - Such as acceptance at international conferences and academic journals. A peer-review experience valuable.
  - Claims for originality/novelty and usefulness/benefit must be the same both inside and outside the school.
  - Utilize experts outside the school.
- Guidance (correction of sentences, detailed comments, etc.) will not be provided for the details of your documents (including doctoral dissertations).
  - A degree is given for individual ability. A thesis is an object for judging your abilities.
  - Apply your items in the guidelines by yourself, consider them, and create your own draft answer.

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# Schedule

- 1S --- **Setting** your research topic.
  - Deepening the research concept, collecting information (literature survey, etc.), acquiring skills (algorithms, tools, etc.)
- 2S --- **Implementation**.
- 3S --- **Experiment**.
  - Results and analysis.
  - Writing full-length manuscript.
- 4S --- **Update**.
  - Additions and revisions.
  - Thesis completion.

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