8th UNISEC-GLOBAL Virtual Meeting

- Opening Remarks -

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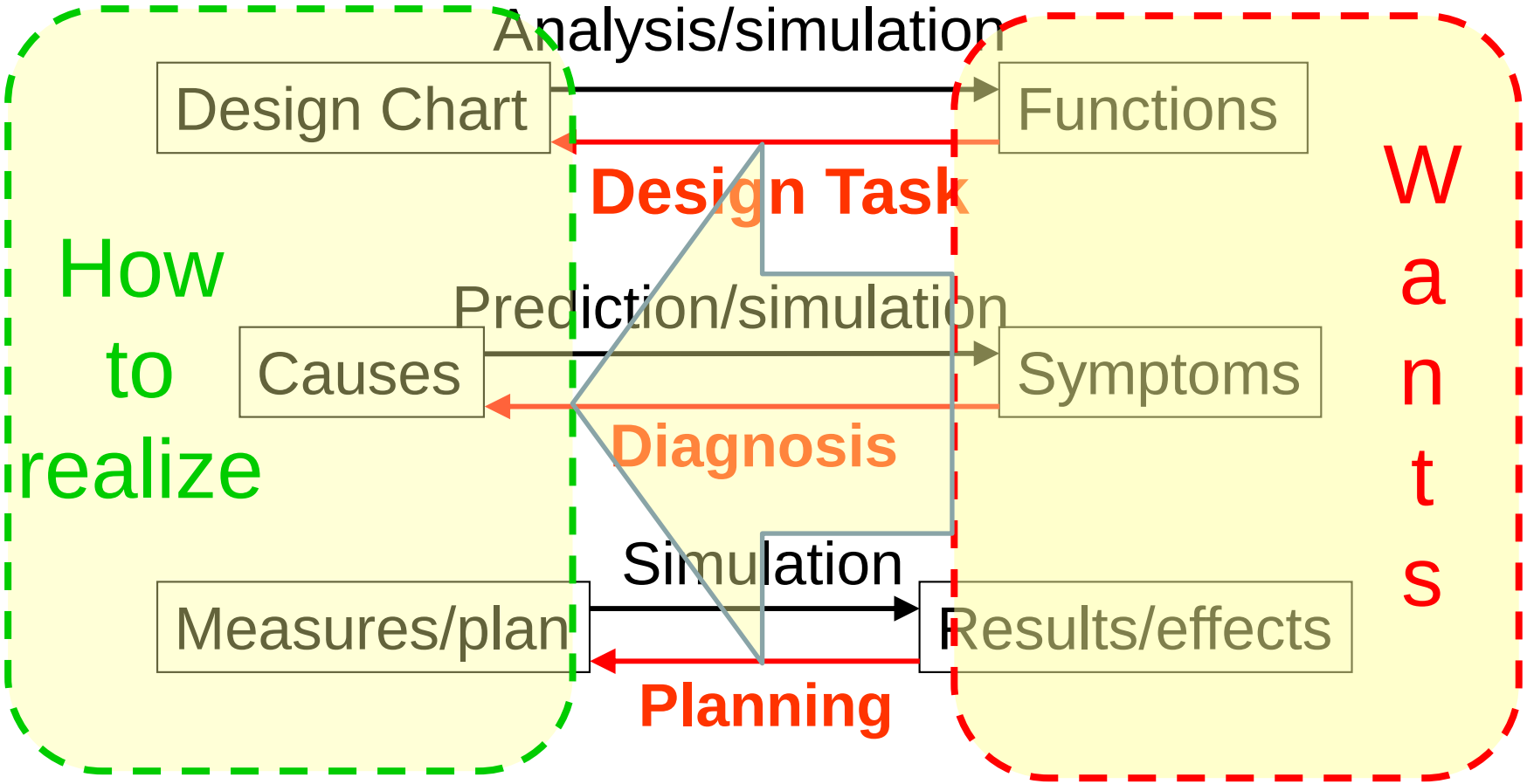
ARLISS 2017
University of Tokyo's team achieved
0m to target in Comeback competition


Nakasuka, Funase Lab.
Intelligent Space Systems Laboratory
The University of Tokyo
13
Satellites Launched
3
Satellites will be launched soon
17
Years of In-orbit Satellite Operations
110
Students Graduated @2020
XI-IV (2003)
In operation (17 years)
XI-V (2005)
In operation (15 years)
PRISM (2009)
In operation (11 years)
MicroDragon (2019)
In operation
Collaborator: VNSC
HODOYOSHI 1, 3, 4 (2014)
In operation (6 years) Collaborator: Axelspace, NESTRA
Strix-α (2020)
In operation
Collaborator: Synspective
Nano-JASM
Awaiting launch
Collaborator: NA
What is “satellite development” ?
What you can learn through it ?
Let’s look at satellite development as a “problem solving” activity.
AQT-D (2019)
In operation (1 years)
Collaborator: UT-SPL
G-Satellite (2020)
In operation
Collaborator: TOCOG, JAXA
Next-Generation 6U CubeSat
under development

Satellite Development as “Problem Solving”



- From “wants,” you should derive “how to realize them.” This task is called “Inverse reasoning (←),” not “forward reasoning (→).”
- Students have learned math, physics, electronics, structure dynamics, etc. in schools/universities, which are all lectures on “forward reasoning.”

Importance “Problem Solving” training

- Life is full of “problem solving”
  - For most of the problems, there are not answers yet.
  - Most of them cannot be solved by knowledge and skills in a single area
  - Setting “goal” by yourself is also important
- Satellite/CanSat development provides excellent opportunity of learning “problem solving”
  - No correct answers exist before
  - Cannot be developed by single technological area
  - You can set your own goals for your project
- You can get good training only when you have **strong desire to solve the problem** !!
  - Satellite/CanSat development provides this motivation

CanSat “ARLISS” event in 1999 - now

2001年～　Comeback Competition

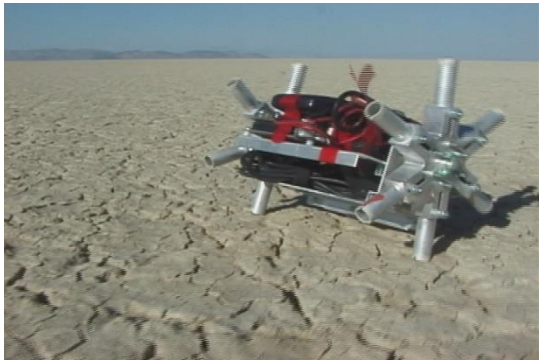
Participating Universities 2002

Univ. of Tokyo

Kyushu Univ.

Nihon Univ.

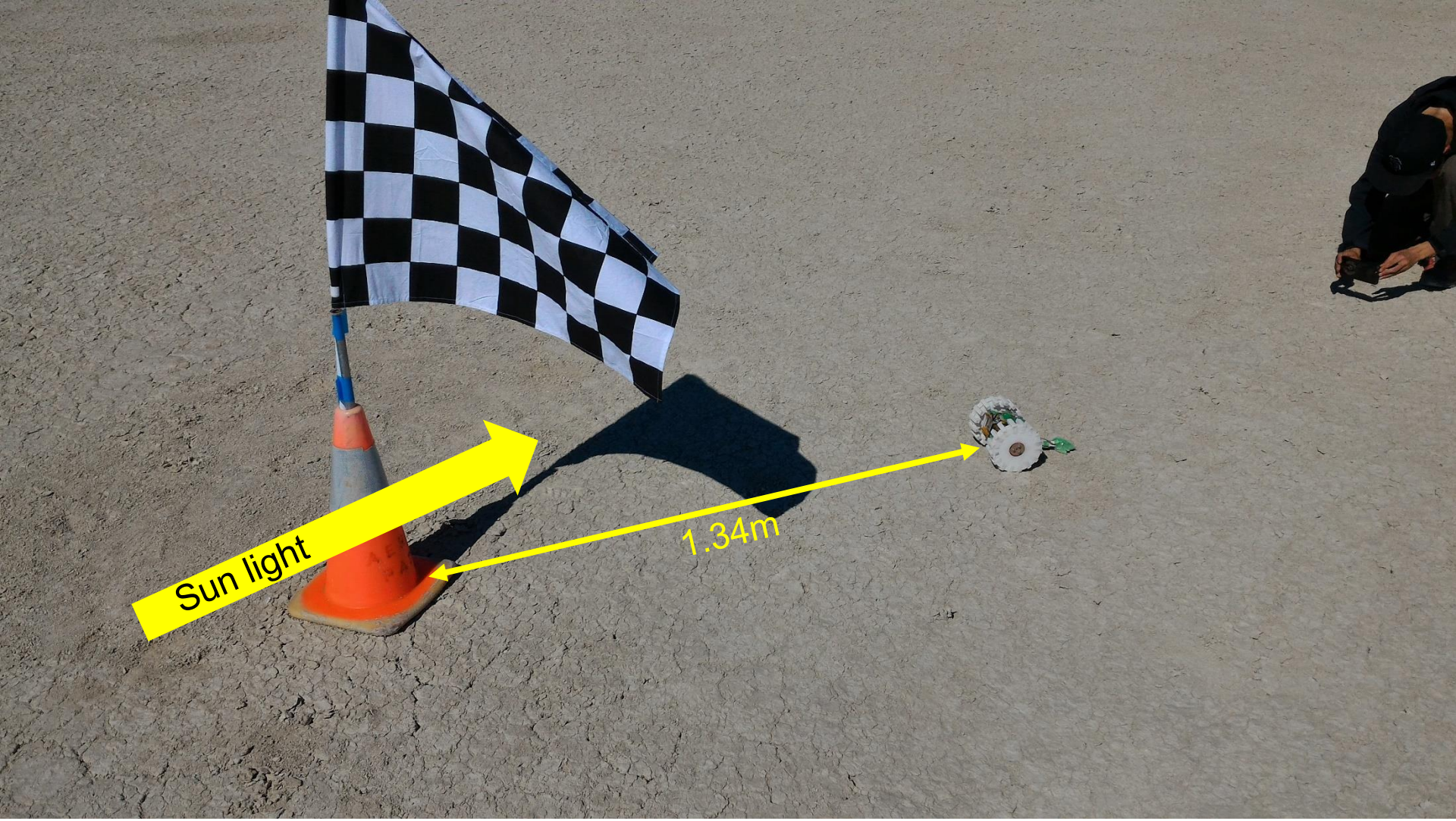
Tohoku Univ.



Tokyo Institute of Technology

Stanford Univ.

ROVER



2017, our team reached 1.34m to the target by GPS navigation, and changed to “camera navigation” to reach the target. But…

Because of coming sun-light, its camera could not recognize the target and gave up after some waiting time.

They still had one more chance in two days…

- They modified the strategy and changed the software.
- They did on-site tests many times to check the new software.

- And realize “0 m” to the target in their second run !!

This is really a “problem solving” !!

Strong motivation “We want to win the competition!”

Now full of difficult problems !!

Problem solving gets even more difficult and should take more factors into account.

- You don't have to solve the problems alone
- Find out persons who have the required skills, knowledge, human network, facility, money…..(UNISEC GLOBAL network may be used !)
- You can set your targets which are worth pursuing while feasible
- You should have strong desire to solve the problem and propagate your enthusiasm and will to the team members.
- These tasks and mind can be trained in Satellite/CanSat development !