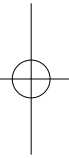
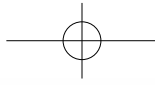
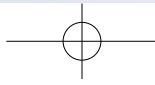


System Safety Engineering

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System Safety Engineering



2

System Safety Engineering Laboratory

Professor / YAMAGATA Hiroshi

- ▣ Organizational management, leadership and policies for safety
- ▣ Danger flies from the sky
- ▣ Let's go outside


<http://safety-management.na.coocan.jp/>

Supervisor Professor / YAMAGATA Hiroshi

Professor Yamagata wore two pairs of straw shoes, a professor of this university and an official of Kasumigaseki, for about five years. He has been devoting himself to education and research at this university since August 2021. He makes use of the network of people, discusses with outsiders anyway, and values social contribution through research results.



Research Content

The people, money, and time available for safety are limited. We are studying efficient organization and management. We are also researching the mechanisms and preventative measures for fraud in organizations. These are applied by graduates in the real world.

To ensure safety, we must prepare for external threats as well as countermeasures against breakdowns and mistakes. We propose a protection method that protects people and equipment from collisions of high-speed flying objects (flying objects due to tornadoes, missiles, aircraft, etc.), and search for a more effective protection method by verifying the effect of the idea by computational simulation.



A Day in the Lab

The laboratory holds regular seminars every week. In the seminar, there is a time of "chaos" to come up with various unexpected ideas about the research theme and a time of "logic" to organize the thoughts. Of course, we will also check the progress of your research. Stimulating each other leads to unexpected jumps. External stimulation is also important. We will actively discuss with external research institutes, universities, and companies.

By the way, the teacher loves Niigata sake. Some of the recent sake is like wine, which is popular with students.

Thesis Subjects

- ▶ No data due to newly established laboratory

Major employers of Graduates

- No data due to newly established laboratory

The number of PhD Graduates

0

150

Writer : Professor Yamagata Hiroshi, System Safety Engineering

教員名

YAMAGATA Hiroshi

キーワード

safety
fraud
collision
management

3



Supervisor

Research Content

A Day in the Lab

Thesis Subjects



Major employers of Graduates

The number of PhD Graduates



Mechanical

Electrical

Management

Materials

Civil

Nuclear Technology

System Safety

Innovation

4

Machine-Environment System Design Engineering Laboratory

Professor / ABE Masajiro



- ▣ Aiming for Cooperation and Symbiosis of Mega Machines, Humans and Environments as a System
- ▣ Studying the System Dynamically and Scientifically from Macro and Microscopic Views
- ▣ Making Innovation of Safety and Comfort of the System



http://mcweb.nagaokaut.ac.jp/j/laboratory/laboratory_14

Supervisor Professor / ABE Masajiro

Autonomy of each student is respected and we can study freely. However when we face difficult tasks, we can get many appropriate advices from professor that will help us very much. Our professor also has a humorous aspect, so you can study with comfortable conditions under less stress or pressure. Assistant Professor Yokota became a member of our lab in 2020. He is very kind and helpful to us in our research and personal life.



Research Content

According to subjects, we conduct research with using dynamic numerical analysis and experiments by the following three groups.
HSD (Hybrid Safety System Design and Development) Group
 For construction machines working on rough terrain, we are challenging to design and develop hybrid safety systems that can ensure the safety of the machines mainly related to rigid stability and structural failure while cooperating with human.
SDE (Symbiotic Design with Environment) Group
 We are researching cargo handling machines used in severe environments such as strong winds and earthquakes. We are aiming to establish design, development and management guidelines for harmonizing these machines with the environment.
GMD (Granular Materials Dynamics based Design) Group
 We are exploring optimum design methods based on dynamic analysis for many types of machines dealing with various granular materials such as snow, soil and waste.



Off-road working machine model for experimental analysis

A Day in the Lab

We are carrying out projects by each group mentioned above. Beside the project theme of the entire group, individual research theme is given to each member. The highest grade students become project leaders to promote research. According to each research theme, students autonomously make detailed research plan and put experimental and/or numerical analysis into effect with mutual guidance. Regularly, we have meeting and seminar once in every week. Then, we discuss about the status and progress of research and sometimes exchange views about related research trends abroad with our professor. There is no core time, so the students can study freely with self-management. We also plan and practice various events such as parties or summer trip at special occasion for deepening our member's friendship.



Group photo of laboratory members

Thesis Subjects

- ▶ (M) Experimental Analysis of Friction Characteristics between Gantry Crane Wheel and Rail in the Case of Water or Grease in Interface
- ▶ (M) Fundamental Development of MR Simulator for Off-road Working Machine Considering Effects of Wind
- ▶ (M) Effects of Shearing Velocity and Melted Water on Tribological Characteristics between Snow and SS400 at under High Pressure

Major employers of Graduates

The number of PhD Graduates

2

- KOBELCO
- KYB
- TADANO
- DAIHATSU
- HITACHI

- NSK
- BOSCH
- HINO
- YOKOHAMA
- TOKYO

- Yamaha Motor
- Unicharm
- SoftBank

152

Writer : AKIMURA Manaya, Mechanical Engineering
(National Institute of Technology, Tomakomai College)

教員名

ABE Masajiro

キーワード

Construction Machine
Materials Handling Machine
Snow Removal Machine
Symbiotic Design with Environment

5

Reactive Fluid Engineering Laboratory

Associate Professor / SUZUKI Masataro

- ▣ Student-driven research
- ▣ Learn combustion from scratch
- ▣ You will learn to think logically

Supervisor Associate Professor / SUZUKI Masataro

While respecting the autonomy of the students, he gives them appropriate advice to solve every problem they may face. In addition, he is a friendly professor who likes joking, which makes the teacher-student relation feel much closer



Research Content

- Acoustic Excitation

By applying sound waves from a speaker to a jet diffusion flame, the flame shape changes. In our laboratory, we are elucidating the mechanism of acoustic excitation phenomenon through measurement and analysis under various conditions.

- Thermophoresis

In any space where there is a temperature gradient present, small particles move in a strange way. If this movement can be clarified, control of soot particles in combustion engines could be expected.

- Smoldering

Smoldering is a form of combustion which involves a large amount of smoke that proceeds without the presence of a flame. In this laboratory, we are conducting experiments to elucidate the mechanism of smoldering.

- Re-ignition

In a fire, after extinguishing activities have ended, unburned combustible material may re-ignite. Re-ignition can be very unpredictable, which makes fireextinguishing activities extremely difficult. In our laboratory, we are studying how to extinguish fires without any risk of re-ignition, and how to prevent the re-ignition of flammable materials.



The experiment of acoustic excitation

A Day in the Lab

In this laboratory, there is no core time and there are no morning seminars.

For this, students can proceed with their laboratory activities at their own pace.

However, if they don't plan or work properly, leading to their research not progressing, they will most likely get in trouble when presenting their progress reports.

Progress report seminars are twice a week, and there is a preestablished order in which people present. Seminars are extremely important since there is also a Q&A session in which students get feedback regarding their research topic. This makes it clearer for them to know what to do next in their investigation.

This is a laboratory where you can develop the ability to find and solve problems by yourself.



A Laboratory Photo

Thesis Subjects

- ▶ (M) Experimental and Numerical Analysis of the Acoustic Excitation Phenomenon of Jet Diffusion Flames
- ▶ (M) Experimental and Numerical Analysis of the Thermophoresis Phenomenon
- ▶ (M) Limiting Characteristics of Smoldering

Major employers of Graduates

The number of PhD Graduates

2

- Toyota Autobody
- Suzuki
- Japan Tabaco INC
- Toshiba
- Mitsubishi Electric

- Yamaha Motor
- Kobelco
- Hitachi Chemical
- Sanden
- Nissin Seiko Group

Writer : IWATA Musashi, Mechanical Engineering
(National Institute of Technology, Gifu College)

153

6

Safety Data Management Laboratory

Associate Professor / ZHANG Kun



- ▣ Data Management
- ▣ Safety Big Data Research
- ▣ Product Accident Data Analysis

Supervisor Associate Professor / ZHANG Kun

Dr. Zhang insists on putting her faith in research and is adept at generating innovative ideas. She is passionate about helping students and giving them personalized guidance on their research as well as their work. In addition, Dr. Zhang looks forward to bringing positive energy to all.



Research Content

We are interested in the analysis and utilization of various data in the field of safety. For example, we can extract keywords and lexical relationships from redundant descriptive text in product accident databases. We provide product designers and market surveillance departments with useful information obtained by building domain knowledge ontology models.



DIKW Model

A Day in the Lab

Every Wednesday is seminar day for all students. The seminar consists of two sessions: Research progress report session and English free exchange session. In the seminar, the teachers are always kind and helpful, and it is easy to communicate with them.



Seminar Day

Thesis Subjects

- ▶ (B) A survey of the current state of open data in Japan and other countries.
- ▶ (B) Designing a playground equipment accident database using neo4j.
- ▶ (M) An Analysis and Visualization of Accident Data of Elderlies Using Graph Database

Major employers of Graduates

The number of PhD Graduates

0

- 株式会社フジ機工 小千谷工場
- 森塾 長岡

154

Writer : FENG Xiaodong, Information Science and Control Engineering
(Nagaoka University of Technology)

教員名
ZHANG Kun

キーワード
ontology
data science
Product data
data management

【校正時ご確認をお願い致します】
□ SDGs を日本語版と合わせました。

7

Behavior-based safety laboratory

Associate Professor / HOJO Rieko



- ▣ Quantitatively and objectively measure and evaluate behavior of workers and machines at worksites
- ▣ There is a principle in human and machine "behavior", and it is possible to predict, evaluate and control using procedure of behavior analysis.
- ▣ Establish experimental procedure measuring fluency and well-being targeting workers at work

Supervisor Associate Professor / Rieko HOJO

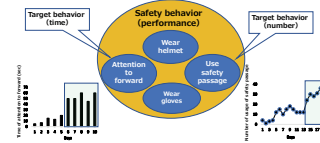
The original research area of mine was the neuro-behavioral psychology of animals using pigeons and mice. Since I was engaged in medical care (as a registered nurse and midwife), I will consider why humans behave unsafely using objective indicators such as human behavior and biomarkers and subjective evaluation indicators such as well-being and stress. Also, I would like you to learn what is the procedure for transforming unsafe behavior into safe behavior using behavioral analytics methods.



Research Content

The original research area of mine was the neuro-behavioral psychology of animals using pigeons and mice. Since I was engaged in medical care (as a registered nurse and midwife), I will consider why humans behave unsafely using objective indicators such as human behavior and biomarkers and subjective evaluation indicators such as well-being and stress. Also, I would like you to learn what is the procedure for transforming unsafe behavior into safe behavior using behavioral analytics methods.

From uncountable Performance to countable target behavior

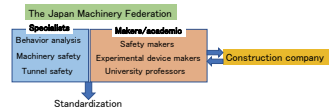


From uncountable Performance to countable target behavior

A Day in the Lab

Why do unsafe behaviors occur? All behaviors derived by human are always accompanied by "consequence". Usually, we tend to focus on the "cause" before the behavior. However, it is thought that action is maintained, enhanced, reduced and/or eliminated by results after the action in the field of behavior analysis. By focusing on results (changes in the environment) after the behavior appears, it is possible to change the behavior for optimal direction. What is important is that there are overwhelmingly more cases of past behavior history (learning) and environment creating behavior than various behaviors occurring due to "personality" or "innate nature". This is a way of thinking that goes against the causal relationship that is generally spoken, but once this thinking circuit is created, it will be possible to grasp various phenomena occurring around us from a different perspective.

Fusion of machinery safety and BBS



Fusion of machinery safety and BBS

Thesis Subjects

- ▶ No data due to newly established laboratory

Major employers of Graduates

- No data due to newly established laboratory

The number of PhD Graduates

0

Writer : Associate Professor HOJO Rieko, System Safety Engineering

155

