

Department of Management Science and Technology

Laboratories	Staff	Research Themes
<p>Management of Technology (Management of Integrated System Technology)</p>	<p>Assoc. Prof. Rihito Kuroda</p>	<p>For realization of sustainable, safe, secure and healthy society, researches on advanced image sensor technologies including semiconductor processes, devices and integrated circuits as core of intelligent interface system are being conducted in this field of study. Through research, development, and practical realization of advanced technologies including, but not limited to, following topics, students are trained to earn management skills as well as high technological specialities.</p> <ul style="list-style-type: none"> • Statistical measurement of miniaturized device characteristics • Advanced process and device technologies for integrated circuits • High sensitivity wide dynamic range image sensors • Ultra-high speed image sensors • Highly accurate realtime spectral imaging • R&D and technological strategy management
<p>Management of Technology (Technology Policy)</p>	<p>Prof. Shuichi Ishida</p>	<p>Innovation in industry is a process that involves an enormous amount of uncertainty, human creativity, and opportunity. This unit delves into the emergence of new technologies and services, and studies how to develop products and services in keeping with overall strategy and policy. In addition, we have expanded our research domain to encompass new issues in the next generation devices, product design, and AI.</p> <p>Research topics:</p> <ul style="list-style-type: none"> • R&D strategy • R&D organization • Technology road mapping • Science and Technology policy • High-Tech Startups
<p>Management of Technology (Comprehensive Biomedical and System Engineering)</p>	<p>Assoc. Prof. Norihiro Sugita</p>	<p>We are studying advanced medical and welfare systems based on communication and information technologies. The study focuses not only on development of a human interface system that is friendly to the elderly and the physically challenged but also on evaluation of the effect of using the system.</p> <ul style="list-style-type: none"> • Virtual reality system for medical care and welfare • Evaluation of effects of video images based on biological data • Non-contact measurement system for biological monitoring

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Science, Technology and Society (Energy Systems Analysis and Design)	Prof. Toshihiko Nakata	<p>The laboratory focuses on an integrated design of energy systems for sustainable development. Methodologies includes dynamic modeling, GIS, Sankey diagram with social and economic dimensions on the basis of both engineering economics and systems engineering. The research considers various aspect of energy systems such as technological learning by possible innovation, resilience, zero carbon society, and Sustainable Development Goals.</p> <ul style="list-style-type: none"> • Energy data analysis as a scientific evidence through energy flow, carbon flow, and cash flow approaches • Supply chain for biomass resources based on optimum logistics • Solution for food, water, energy nexus in the year 2050
Science, Technology and Society (Advanced Social Energy Systems)	Prof. Kenji Nakamura	<p>The 21st century is called as “the century of environment” . In the field of electrical engineering, it is essential for further efficient energy generation, transportation, conversion, and usage in consideration of the environment. To realize it, static and rotating machines, and power electronics are key technologies.</p> <p>Our laboratory focuses on the development of high-efficient electric machines, and the advanced system which is composed with several static and rotating machines and power converters.</p> <p>Research topics:</p> <ul style="list-style-type: none"> • Performance improvement of electric machines • Development of magnetic gears and geared-machines • HVDC system for the offshore wind farm • Variable inductors for voltage control in electric power systems • Electric mobility
Science, Technology and Society (Risk Assessment and Management)	Prof. Makoto Takahashi Assoc. Prof. Daisuke Karikawa	<p>The aim of our research is to enhance the safety of large-scale complex systems by utilizing the methods of risk assessment and management. Focusing on the aspects of interaction between human and machines, we study human factors problems from variety of viewpoints. In addition, dialogue between experts and citizens about science and technology is also studied for promoting mutual better understanding of the risk and benefit of advanced technologies. The examples of our research topics are as follows:</p> <ul style="list-style-type: none"> • Human factors study for air traffic control (ATC) system • Evaluation of human-machine interface using human brain mapping method • Cyber security • Science and technology communication

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Science, Technology and Society (Management of Transportation and Society)	Assoc. Prof. Takeshi Nagae	<p>We conduct pioneering research of the transportation management for sustainable society, taking into account the recent advances in self-driving technology, electric vehicles, big data in transportation, etc.</p> <p>The relevant topics are:</p> <ul style="list-style-type: none"> • strategies for enhancing reliability and resiliency of urban road networks; • design of accessible and manageable smart public transportations; • development pricing/cost-sharing schemes for efficient mobility sharing; • analyses of a socio-economic system as a mass of intelligent but selfish agents; • analyses of a spacio-temporal dynamics of traffic jam by exploiting big data in transportation; • pricing and decision making on infrastructure projects under dynamic uncertainty.
Science, Technology and Society (Intellectual Property Right)	Assoc. Prof. Nobuya Fukugawa	<p>Entrepreneurship and innovation are critical factors in the improvement in living standards. My lab has tackled with the topics listed below by econometrically analyzing data of patents, publications, and technology transfer.</p> <ul style="list-style-type: none"> • effect of scientific productivity on IPO of university spinoffs; • knowledge spillover from university research to industrial R&D; • technology transfer from <i>Kohsetsushi</i> to SMEs; • determinants of new firm creation at incubators; • effect of patent quality on IPO of biotechnology startups.

For further information, contact us by e-mail: admission_mst@grp.tohoku.ac.jp
 Courses and fields may change in April 2022