

SENDAI

Sendai Cyber Forest Cluster

Outline of the Project

The SENDAI CYBER FOREST INITIATIVE aims at organizing technology-innovative clusters in and around Sendai City, Miyagi Prefecture, by creating new industries and jobs in a variety of the fields that are based on, originated from or related to intelligent electronics. To make them a favorable model in the international society, these clusters are comprehensively designed to integrate the information and communication industry, its supporting industries including the production of components and the development of software or application programs, and the industries of medical, healthcare and environmental equipment that fully utilizes the advantages of information and communication technologies.

During the preparation stage to materialize this initiative, universities and business enterprises as well as prefectural and municipal governments in the Sendai region will launch a joint project, which aims at setting up an "Intuitive Communication Network beyond Space and Time". This network shall grow into an information and communication network full of human initiatives for the next generation, which will support the daily lives of people and those staple industries of the region.

Member of the Headquarters

- President..... FUJII Hajimu (Mayor of Sendai City)
- Vice President..... MATSUKI Shinichiro (Vice Governor of Miyagi Prefecture)
- Project Director..... HIRAMA Hideo
- Research Director..... SAWADA Yasuji (Professor of Tohoku Institute of Technology)
- Science and Technology Coordinators... TAKAHASHI Junzo
YAMADA Makoto

Central Project Organization Intelligent Cosmos Research Institute,Ltd.

Core Institute(s) Tohoku Univ.

Participants

Industries...Advantest Laboratories,Ltd., Matsushita Communication Sendai R&D Labs. Co.,Ltd.,
Cyber Solutions Inc., I.T Research Co.,Ltd., NEC Tokin Corporation

Universities...Tohoku Univ., Tohoku Gakuin Univ., Tohoku Institute of Technology

Governments...Industrial Technology Institute.Miyagi Prefectural Government

Main Researchers

NAKAZAWA Masataka (Prof., Research Institute of Electrical Communication, Tohoku Univ.)
YONEYAMA Tsukasa (Prof., Undergraduate School of Environmental Information Engineering,
Tohoku Institute of Technology)

NEMOTO Yoshiaki (Prof., Graduate School of Information Sciences, Tohoku Univ.)
SAWAYA Kunio (Prof., Graduate School of Engineering, Tohoku Univ.)
INOOKA Hikaru (Prof., Graduate School of Information Sciences, Tohoku Univ.)
KAWAMATA Masayuki (Prof., Graduate School of Engineering, Tohoku Univ.)

Outline of the Researches

●Next-generation Photonics

During the initiative, this research aims to reduce substantially the cost of simplify multi-layer wave systems, and develop a future communication mode that uses different phases of light. For this purpose, the team in charge will try to establish, as pioneers, a high precision, light-frequency regulation laser technology in the 1.5 μ m range. In addition, they will strive to develop a frequency-stabilizing mode synchronous laser system, which will act as the light as the “ruler” in the optical fiber laser during the frequency-stabilizing single mode.

[Engineering Faculty, Research Institute of Electrical Communication, Tohoku Univ., Advantest Laboratories,Ltd.]

●Next-generation Wireless Systems

This research aims to develop a micrometer-band wireless system having very high speed and large transmission capacity with baud rates of 1Gbps at frequencies of 60GHz. In addition, the team in charge will strive to establish mass production technology of the system so that it can be put into practical use in the fields that attract public attention, such as wireless local area networks (WLAN), home LAN systems, and ad hoc networks.

[Engineering Faculty, Tohoku Institute of Technology, Matsushita Communication Sendai R&D Labs. Co.,Ltd.]

●Intelligent Network Security Management

This research aims to establish new internet security and management technologies, such as tracking technology of hackers and self-learning technology that can automatically detect illegal accesses and interference. Based on these technologies, the team in charge will strive to develop internet security and internet management technologies that will conform to the ubiquitous network environment in the near future.

[Engineering Faculty, Tohoku Univ., Cyber Solutions Inc.]

●Intelligent Communication Interface

A 4G cellular phone system will be introduced for practical use around 2010. An intelligent antenna that can instantly respond to the different radio frequencies is definitely required for the development of future-generation mobile telecommunication systems. This research aims to develop the intelligent antenna’s fundamental technology so that the Cyber Forest will take a leading position in the ever-growing mobile telecommunication market.

[Engineering Faculty, Tohoku Univ., Matsushita Communication Sendai R&D Lab.Co.,Ltd.]

●Intelligent Monitoring

Precise tracking of human movements is required in the ubiquitous computer environment. This research aims to develop a portable instrument, which can precisely measure human movements in daily life and estimate the energy consumption of such movements. The relevant software will be applicable to different purposes. Depending on the concept, this technology can be applied to a wide variety of fields, not just in the medical and welfare services.

[Engineering Faculty, Tohoku Univ., I.T.Research Co.,Ltd.]

●Intelligent Barrier-free Devices

Bone-anchored hearing aids, that use a multifunctional actuator, meet the needs of people with moderate to severe hearing loss. This research aims not only at developing these hearing aids but introducing a hearing aid with considerably improved functions, such as flexible conformity to different auditory conditions and the hearing aid’s software update function since the bone-conductive auditory characteristics vary among individuals.

[Engineering Faculty, Tohoku Univ., NEC Tokin Corporation]

Expected Results

- Sendai Cyber Forest Cluster shall produce an “Intuitive Communication Network beyond Space and Time”, which is a human network of information and communications.
- Based on the needs of regional business enterprises and markets, the Cluster will promote new industries and jobs that are arising from or related to extensive intelligent electronics.
- Realizing a society with adequate social-welfare services