Gifu/Ogaki Robotics Advanced Medical Cluster

Life Sciences IT Environment Nanotech/Materials

Gifu/Ogaki

Providing the best medical diagnosis, care, and education using robots and IT

Cluster Vision

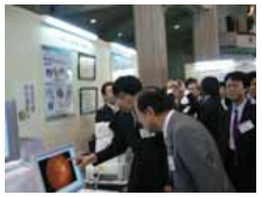
In Japan of the 21st century, patients seek safe, highly accurate, and quality medical treatment. In addition, both medical institutions and the National Government are seeking to provide efficient medical services and to reduce medical costs.
Through the Gifu-Ogaki Robotics Advanced Medical Cluster project, our aim is to create a "Technology Innovation Cluster" through the integration of medical care services and engineering in order to establish a safe and patient-friendly society. Taking full advantage of the cutting-edge technologies and businesses related to robotics, information technology (IT), and medical education in the Gifu/Ogaki region, we are developing highly advanced diagnostic systems and medical equipment, and we are also working to provide safe medical treatment for every patient. Various research and development programs are already in place in Gifu Prefecture in an aim to introduce pioneering medical education and training systems, which are effective at preventing medical accidents and improving medical quality. We are also promoting health, welfare and nursing care support systems.

Project Overview

We will assemble various local organizations and enterprises with superior research potential in the fields of robotics, virtual reality (VR) and IT. Through active collaboration between local organizations and located outside Gifu Prefecture, we aim to develop an innovative medical education system and promote the use of highly-advanced medical technology in medical treatment and nursing care services.

IMPLEMENTATION OF JOINT RESEARCH PROJECTS BETWEEN INDUSTRY-GOVERNMENT-ACADEMIA
We are currently implementing research and development programs in the following fields by forming cooperative relationships with a wide range of organizations in business, government and university circles:
Robots that perform surgery safely and with a high degree of precision, imposing as little a physical burden on patients as possible; medical education systems to improve the diagnostic and surgical skills of medical personnel, including "Minimally Invasive Microsurgery Support Medical Training Systems"; "Medical Diagnosis Support Systems" to quickly and accurately assist with medical care and diagnosis by analyzing medical image data; and "Medical Care Support Systems" to reduce the burdens of care givers and care recipients in an aging society.

PROMOTION OF COLLABORATION IN MEDICINE AND ENGINEERING
We have been actively promoting collaboration in medicine and engineering. Specifically, we host meetings of the Medicine-Engineering Collaboration Council, where researchers who specialize in clinical evaluation and engineers who research and develop new systems using robotics and IT can exchange opinions and share information with one another. In addition, the "Cluster Plaza," located within the Gifu University Department of Medicine, serves as a base for such collaboration in medical care and engineering.


Project Developmnt

PROJECT DEVELOPMENT
We have established the "Life Care Business Study Group" in order to create a business hub for medical and welfare equipment enterprises in the Gifu/Ogaki region. The members of this group gather and share information in addition to researching issues common to both the medical profession and welfare-related business. We have also been presenting the major achievements of this group at exhibitions held both inside and outside Japan.

Project Director
Satoshi Nishimura


Satoshi Nishimura is a former R&D Lab Directing Manager of the Multimedia Company at SANYO Electric Co., Ltd.

New Industries Based on Medicine, Health, and Welfare

The purpose of this project is to research novel medical technologies characterized by their use of robotics, information processing, and other engineering technologies and to develop advanced medical devices including surgery robots, diagnostic imaging equipment, medical information systems, medical education systems, and medical sensors. With the biotechnologies fostered through this project serving as the technical base, however, we ultimately expect this project to invigorate the Gifu area with novel industries centering on medicine, health, and welfare. While growth is expected for industrial fields, a technological base with high potential is required in order for novel industries to be victorious in the severe global competition of the future,. We therefore request R&D of the highest quality—quality of world-class caliber—from personnel at our universities and research institutions. Finally, the cooperation of personnel at private companies holds the key to the success of our projects. Over the long term, until our new enterprises are on track and our new industries are up and running, industry, academia, and government must remain strongly linked by a shared concept and thereby "align their vectors." As Project Director, an important part of my work is the focusing and directing of these vectors.

Cluster Headquarters

○President……Toshio Kinjo (Professor Emeritus, Gifu University)
○Advisor……Toshio Kuroki (President, Gifu University)
○Project Director……Satoshi Nishimura
○Chief Scientist……Hirofumi Takemura (Professor, Gifu University)
○Deputy Chief Scientist…Masakatsu Fujie (Professor, Waseda University)
Yasutomi Kinosada (Professor, Gifu University)
○Science and Technology Coordinators…Akihiko Takiguchi, Shuji Yanase, Kouji Sanaka

Core Organization

Gifu Research and Development Foundation

Participating Research Organizations (Bold: Core Research Organization)

Industry…SHINKO OPTICAL Co., Ltd., Suntec Corp., CMC Technology Development Co., Ltd., Tokai Medical Products Inc., Kyoto Kagaku Co., Ltd., SHIMADZU Corp., ASKA Corp., Sumiiryou Co., Ltd., Sakamoto Model Corp., Crown Development Co., Ltd., Medical ai, Ltd., iXs Research Corp., SEGA Corp., Electric Sheep Co., Ltd., Mould Planning HANADA, EBM Co., Ltd., Nikkou FA Co., Ltd., TAK Co., Ltd., ALOKA Co., Ltd., KONICA MINOLTA MEDICAL & GRAPHIC, Inc., SANYO Electric Co., Ltd., Media Drive Corp., InfoFarm Co., Ltd., Densan System (DSK) Co., Ltd., Concentration Heat and Momentum Ltd., TALKENG Co. Ltd., Ishikawa Seisakusho, Ltd., Parama-Tech Co., Ltd., RIKEN-SANGYO Co., Ltd., ESP Planning Co., Ltd., Activelink Co., Ltd., MIZUNO TECHNICS Corp., Asahi Roentgen Ind. Co., Ltd., Think Free Co., Ltd., IWATA MFG. Co., Ltd., Ecchandes Inc., Kitani Co., Ltd., Encephalon Co., Ltd.
Academia…**Gifu University, Waseda University,** Nagoya Institute of Technology, Ritsumeikan University, Asahi University, Shiga University of Medical Science, Gifu National College of Technology
Government…Gifu Prefectural Research Institute of Information Technology, Gifu Prefectural Research Institute for Human Life Technology

Main Results

<Successful implementation of seven new systems for medical treatment and training>
The seven new systems are as follows:
-Patient simulator: Naresome–san—Robotic Patient Simulator for Palpation and Diagnostic Interview Skills;
-Medical image database: Schema—a collection of digital medical image data;
-Torso Projection System – A system that projects human internal structures on a curved torso;
-Surgery Skills Enhancement System for anastomosis training;
-Arteriosclerosis Examination System to detect arteriosclerosis based on ultrasound images of blood vessels;
-Atlas of Ultrasound Images of Arteriosclerosis—this system provides basic knowledge about and explanations of testing procedures, measurements, and analysis of the carotid artery through ultrasound images; and
-Highly Efficient Electronic Medical Records System with data entry support.


Patient simulator for palpation and diagnostic interview skill sets

<ESTABLISHMENT OF THREE VENTURE BUSINESSES>
The following three venture businesses have been established under university research initiatives:
-Medical ai, Ltd., which produces and sells digital medical image data;
-Simulation Medical Education, Ltd., which develops training software using simulation models and sells simulation education materials; and
-EBM Co., Ltd., which produces and sells surgical skill enhancement systems. EBM Co., Ltd. received the Technology Award and the Minister of Education, Culture, Sports, Science and Technology's Award in the 2005 Campus Venture Grand-Prix.


Surgical Skills Enhancement System for anastomosis training