Shahid Beheshti University

Institute of Medical Science and Technology (IMSAT)

2021

Contents

Institute Overview

History

Recent discoveries and inventions are the result of combinations and collaborations among different disciplines of science, which seemed irrelevant until a few decades ago. The interaction of science, engineering and medicine to develop technologies and applying them optimally to improve health services is an example of interdisciplinary collaboration. Although the separation of the universities of medical sciences from the other universities may have seemed useful at some duration in Iran, but today has seriously damaged the generation and development of intermediate disciplines, which has increased the gap between medical science and other sciences. In order to reduce this gap and strengthen the interaction among the researchers in basic sciences and engineering with ones in medical sciences, Prof Farhadi, Minister of Ministry of Science, Research and Technology (MSRT) and Prof Reza Malekzadeh, Deputy Minister of Research and Technology of the Ministry of Health and Medical Education agreed on the idea of establishing a joint research institute between the two ministries on December 2015. They assigned this mission to Prof Mohammad Mehdi Tehranchi, the former rector of the Shahid Beheshti University (SBU). Subsequently, Prof. Mojtaba Zarei was appointed to set up this research institute under the name of Institute of Medical Sciences and Technologies (IMSAT). The IMSAT with MSc program in 3 research groups as nuclear technology in medicine, medical engineering, and clinical research was approved by the Development Council of the MSRT on June 2016.

Objectives

1. Creativity and innovation in bio-electric, bio-magnetic and bio-photonic medical engineering technologies in order to improve health services
2. Creativity and innovation in the application of nuclear technologies in biomedical sciences and health
3. Engineering inventions in the field of health
4. Carrying out clinical trials to evaluate technologies in the field of health
5. Applying mathematics, statistics and computer science in the analysis of medical information and disease modeling
6. Establishment and operation of the National Brain Bank in cooperation with the Forensic Medicine Organization of the country
7. Creativity and innovation in the field of biomedical image analysis

Charter's Institute

The main charter of establishing this research institute is interdisciplinary cooperation, meritocracy, attention to the society needs, dissemination of scientific and technological skills and transferring new technologies to the country using the establishment of extensive international connections. During the short life o IMSAT, it was very successful in making strong international connections and scientific collaborations with top rank universities and scientific centers. Our efforts have been focused on educating better students, conducting effective research, spreading and disseminating science nationally and internationally, and building important scientific infrastructures. The strategy of this research institute has always been to attract young elites, based on meritocracy and measurable abilities. Accordingly, this research institute has succeeded in attracting more than ten Iranian elites abroad in the fields of medicine and engineering. The IMSAT is perhaps the only research institution in Iran, where specialist physicians, engineers, and basic science researchers work together side by side.

1. Act according to the law and professional ethics that originate from the teachings and beliefs of Islam
2. The national interest takes precedence
3. Prioritize based on the needs of the country
4. Self-confidence and meritocracy in all aspects of work
5. Respect for the dignity of science, scientist and university
6. Focus on quality rather than quantity in scientific productivity
7. Attracting faithful, specialized and experienced people in the country
8. Setting the standard in medical technologies
9. Training and education in appropriate use of medical technologies
10. Transfer of modern medical technologies to the country
11. Attracting Iranian elites from abroad
12. Educating young elites for the future of Iran
13. Cooperation with other research centers and faculties inside and outside the University to increase the quality of research institute performance

People

Faculty

Mojtaba Zarei, MD, PhD, FRCP
Professor & Director

Research interest: Imaging in neurodegenerative disorders, PET, MRI, MEG

MD, Shiraz University of Medical Sciences, Iran
PhD, Neuroscience, King's College London, UK
CCST: Clinical Neurology, London, UK

Mohammad Ghalei, PhD
Assistant Professor, Co-director & Head of Nuclear Technology in Medicine Center

Research Interest: Synthesis novel radiopharmaceuticals (diagnostics and therapeutics), Radio-analytical Chemistry, Application of radiochemistry in neurology and brain mapping, Environmental Radiochemistry

BSc in Applied Chemistry, Arak Azad University
MSc in SERP (Surface, Electro, Radiation & Photo) Chemistry, University Paris SUD, France.
PhD in Radiochemistry & Radiation Chemistry from Ecole des Mines de Nantes, France

Masoud Tahmasian, MD, PhD
Assistant Professor

Research Interest: Imaging in psychiatric disorders, sleep studies

MD, Kermanshah University of Medical Sciences
PhD, Neuroscience, Munich Technical University, Germany

Behrouz Salamat, PhD
Assistant Professor & Head of Medical Innovation Centre

Research Interest: Neuroscience, Electrophysiology and Neuroprosthetics, Biosignal Processing, Medical Image Modalities and Processing, Hearing Studies and Biomedical Device Development and Testing

Dipl.-Ing. in Medical Equipment Technology
MSc in Biomedical Eng. from Hamburg University of Applied Sciences, Germany
Ph.D. in Electrophysiology from Center for Systems Neuroscience Hannover, Germany

Saman Noorzadeh, PhD
Assistant Professor & Head of Biomedical Engineering Center

Research Interest: Biomedical (and statistical) signal processing, Brain-Machine Interface, Multimodal data analysis

BSc in Computer Engineering, Shiraz University, Iran
MSc in Artificial Intelligence, University of Grenoble Alpes
PhD in Biomedical Signal Processing from University of Grenoble Alpes, France

Reza Lashgari, PhD
Assistant Professor & Head of Neuroscience and Neuroengineering Center

Research Interest: System/Cognitive Neuroscience, Vision, Brain Engineering, Digital Pathobiology, Medical Device Development

BSc in Medical Sciences, Shahid Beheshti University
MSc in Medical Sciences, Shahid Beheshti University
PhD in Visual Neuroscience from Columbia University & State University of New York, USA

Hasti Shabani, PhD
Assistant Professor

Research Interest: Computational Microscopy, Computational Pathology, Neuroimaging

BSc in both Biomedical Eng. and Electrical Eng. from Amirkabir University, Iran
MSc in Electrical Eng. from Iran University of Science and Technology, Iran
PhD in Electrical Eng. from University of Memphis, USA

Administrative Staff

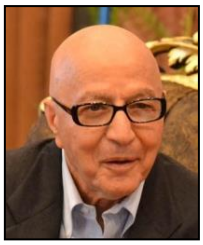
Hamidreza Sharifi
Executive Director

Nastaran Koozehgaran
Educational Affairs Administrator

Sahar Habibi
Research Administrator

Ahmad Koolivand
Care Taker

Adjunct Faculty



Prof. Abass Alavi
Molecular Imaging
University of Pennsylvania, USA

Prof. Poul F. Hoilund-Carlsen
Clinical of Physiology and Nuclear Medicine – University of Southern Denmark, Denmark

Prof. Albert Gjedde
Brain Research – University of Southern Denmark, Denmark

Prof. Massoud Fattahi-Vanani
radiochemistry – IMT Atlantique, Campus of Nantes, France

Dr. Reza Ghaderi
Nuclear Science Department
Shahid Beheshti University, Iran

Dr. Habib Ganjgahi
Big Data Institute – University of Oxford, UK

Prof. Saeid Sanei
Computer Science – Nottingham Trent University, UK

Prof. M. Sadeghi Alavijeh
Neuroscience – Hertfordshire University, UK

Dr. Reza Khosrowabadi
PhD in Computer Science.
Shahid Beheshti University, Iran

Dr. M. Mohammadzadeh
PhD in Electrical Engineering
Shahid Beheshti University, Iran

Dr. H.R. Mahdiani
PhD in Computer Eng.
Shahid Beheshti University, Iran

Postdoc Fellows

Amir Mohammad Alizadeh

PhD in Neuroscience
University of Leuven,
Belgium

Fateme Same'

PhD in Cognitive Science
Shahid Beheshti University,
Iran

Narjes Soltani Dehaghani

PhD in Cognitive Science
Shahid Beheshti University,
Iran

Former Members

Alireza Kashani, MD PhD

PhD in Neuroscience
University of Paris,
France

S.M.M. Alavi, PhD

PhD in Electrical Eng.
University of Limerick,
Ireland

E. Kamrani, PhD

PhD in Biomedical Eng.
Polytechnique Montreal,
Canada

Sh. Faghih-Roohi, PhD

PhD in Biomedical Eng.
University of Tehran,
Iran

S. Javaher Haghighi, PhD

PhD in Biomedical Eng.
University of Toronto,
Canada

Education

In terms of education, IMSAT launched the MSc program in biomedical engineering degree with minor of bio-electrics at SBU on September 2017. Following that, a BSc program in biomedical engineering was launched in collaboration with Electrical Engineering department of SBU. The IMSAT has more than 80 graduate students in MSc and PhD programs. Moreover, IMSAT works closely with researchers and professors of other departments and institutes in SBU as Nuclear Engineering department, Psychology department, department of Science and Biotechnology, Computer Science department, Electrical Engineering department, and the Institute of Cognitive and Brain Sciences.

Programs

The main current educational program is a three-year MSc program focusing on bioelectric major, with an official license from the MSRT since September 2017. The IMSAT will start the PhD program soon.

Courses

The students in MSc program are required to pass a total of 32 credits, which are 9 credits of core courses which are approved by the MSRT, 2 credits of seminar, 6 credits of thesis, and 15 credits for elective or core courses. The core courses, approved by the MSRT, are as follows:

- Biomedical instrumentation

- Electrophysiology
- Medical signal processing
- Medical imaging systems
- Control of neuro-muscular systems
- Modeling of biological systems

The elective courses are selected and presented from the list approved by the MSRT according to the professional background of the faculty members. The main research interest of the faculty members of the IMSAT is about engineering issues in the neuroscience field. Therefore, courses including neural networks, artificial intelligence, brain and cognition, brain functional imaging, pattern recognition are taught here. Moreover, the IMSAT collaborates in other departments and institutes at the SBU for educational courses, such as BSc in medical engineering, PhD in Sports Physiology, PhD in Psychology, and PhD in Cognitive Sciences. This research institute is the only institute offering medical electrochemistry, magnetoencephalography and microscopic imaging courses in the country.

Research

Center of Biomedical Engineering

Biomedical engineering is an interdisciplinary field, which applies engineering principles and materials to medicine and healthcare. The main scopes of this center are:

- Designing electronic devices required in medicine
- Designing imaging devices
- Recording, processing and analyzing biological signals and medical images
- Designing wearable and implantable devices to record biological activities such as movement, respiration, heart rate and brain activity for a desired application

The collaboration of biomedical engineers, electrophysiologists and imaging specialists in the IMSAT makes these aims achieve in an efficient way.

Center of Nuclear Technology in Medicine

Nuclear technology is widely used in medical sciences. After the discovery of radioactivity, the use of radioactive materials and ionizing radiation in the diagnosis and treatment of diseases has increased widely, and today many diagnostic and therapeutic methods of medicine are not possible without these technologies. The development of nuclear imaging techniques not only helps to diagnose diseases more accurately, but also provides a new tool for researchers to identify the mechanism and progression of diseases, develop therapeutic drugs, and study metabolic processes. Today, due to the high importance of nuclear technologies in medicine, the developed countries of the world do a lot of research and investments both in the field of diagnostics (PET and SPECT) and in the field of treatment.

The IMSAT for the further growth of the country in the framework of sustainable development, knowledge-based economy and development vision document by using the abilities of its professors and researchers and cooperation with other researchers inside and outside the country. The country, using close communication between basic science specialists, engineers, pharmacists and physicians, seeks to create the necessary infrastructure to advance nuclear technologies and their application in medicine. Research areas in this group include medical radiochemistry, preclinical and clinical research, and the development of image processing engineering.

The IMSAT, as the first center in the country, is launching a laboratory for research and development of medical radiochemistry for the manufacture and development of radiopharmaceuticals, and in this regard, it is cooperating with prestigious universities in France, Denmark and Germany. Among the accomplishment obtained by this center in the IMSAT, it worth to mention the request from European countries to this center for developing radiopharmaceutical protocols and their synthesis.

Center of Neuroscience and Neuroengineering

Neuroengineering is a branch of biomedical engineering that uses engineering methods to better understand brain function, identify the cause and treatment of various neurological diseases, develop new medical technologies, and ultimately strengthen and improve the nervous system of the brain. Today, the field of neuroscience and neurosurgery of the brain as one of the strategically important scientific fields is considered by many research and academic centers in developed and developing countries.

The field of neuroscience and brain engineering has a wide interdisciplinary relationship with the fields of biomedical engineering, computer engineering, electrical engineering, mechanical engineering, medicine, and mathematical and physical sciences. One of the most basic methods used in the field of brain neuroengineering is the study and recording of electrophysiology, optogenetics and optical imaging of the brains of laboratory animals. With these methods, the activity of neuronal signals and the cognitive and systematic function of neural networks and areas of the brain can be studied. In the field of neuroengineering, we can also strengthen, modify and improve the function of neural networks in the brain by making tools and technological medical devices. These products are sometimes used as neural prostheses, for example, to repair and improve hearing, vision, and sensory motor systems that are impaired. Neural prostheses are high-tech miniature devices that can control and stimulate nerve cells. These prostheses can repair or improve the dysfunction of the nervous system in the brain when the nervous system is malfunctioning or weakened. For example, in the field of hearing, cochlear implants can be implanted in the brainstem and implants in the midbrain. Called sensory-motor disorder.

ENIGMA Sleep Working Group

Enigma is a global consortium located at the University of Southern California and led by Professor Paul Thompson. In this consortium, senior researchers use various brain mapping methods to study the brain in its natural state and in various diseases of the brain, neurology and psychiatry. They answer fundamental and important questions using MRI imaging, genetics, clinical information, and aggregation of data collected from around the world. *Dr. Tahmasian* is responsible to coordinate whole sleep studies within the framework of the Enigma Global Project. Therefore, special attention is paid to sleep studies in the IMSAT. Please follow the link below for more information about this project

http://enigma.ini.usc.edu/ongoing/enigma-sleep/

Computational Pathology Group

Computational pathology aims to improve diagnostic accuracy, optimize patient care, and reduce costs by bringing global collaboration. Computational pathology has the potential to transform the traditional core functions of pathology and not just growing sub-segments such as digital pathology, molecular pathology, and pathology informatics. Digital pathology utilizes virtual microscope, which includes the process of digitizing glass slides using a whole slide image (WSI) scanner and then analyzing the digital images. Different image processing techniques are required

to achieve a reliable image from the biological tissues. The digital data of the slides can be stored in a central cloud-based space allowing for remote access to the information for manual review by a pathologist or automated review by deep learning algorithms. Therefore, computational pathology involves extracting information from digitized pathology images in combination with their associated metadata, typically using artificial intelligence methods to detect, diagnose, and predict different diseases. We aim to develop image analytics that can quantify pathogenesis in a high-throughput, bias-free and robust way.

Laboratories

Laboratory of Biomedical Engineering

In this laboratory, basic equipment for designing and manufacturing electronic devices has been provided. There are also expressions such as voltmeter, oscilloscope, power supply, signal generator and so on. Students who need to design and build a device in their project generally use this lab.

Laboratory of Neurobiofeedback and Biofeedback

The Neurobiofeedback Lab, in collaboration with EEG Info, the largest research and educational institution in electroencephalography and neurofeedback, is equipped with the latest 39-channel electroencephalographs, evoked potential recording system (ERP), neurofeedback (conventional and modern ILF method) and biofeedback. In this laboratory, the electrical activity (signal) of the brain is recorded by surface electrodes by an EEG device. The most important principle in this method is to install the electrode in the standard defined place. After decomposition (spectroscopy), the initial signal recorded at different frequencies can be seen. The amplitude of these frequencies in comparison between healthy and sick people according to the location of the electrode shows differences that are more or less in the sick person than the healthy person. It should be noted that this difference in frequency range can be corrected by the neurofeedback system.

Neurofeedback is a system that tries to teach a person a kind of self-regulation by recording the brain's electrical waves and giving feedback. Feedback is typically provided to the individual through sound, image, and touch. It is through this feedback that a person realizes whether he or she has made a proper change in his or her brain activity. The common neurofeedback method is able to individually and individually modulate the amplitude spectra of alpha, beta, theta and delta frequencies with neural feedback. This process can be done in terms of time in 20 to 40 45-minute

sessions. But the latest neurofeedback (ILF) system, infrared low-frequency neurofeedback, has the ability to regulate the amplitude of brain waves by modifying a single frequency (below 1 Hz) that carries all alpha, beta, theta, and delta frequencies over a period of 20 years. Practice for 15 to 20 minutes. This system is the only system that, in addition to visual and auditory feedback, also provides tactile feedback to the individual. A biofeedback system is a system that works with a function similar to a neurofeedback system, but by recording heart rate, blood oxygen and body temperature and giving feedback, tries to teach a person self-regulation so that a person can increase his body efficiency by achieving physical relaxation.

Currently, joint international research projects between the Research Institute of Medical Sciences and Technologies and other faculties of Shahid Beheshti University in collaboration with EEG Info in areas such as artificial intelligence, increasing attention and reducing reaction time to visual and auditory stimuli, reducing stress Tinnitus and Parkinson's disease are being treated. In the mentioned projects, an attempt is made to find the abnormalities of the electroencephalogram in different diseases according to the location and information of the recording signals (frequency and amplitude) in comparison with healthy people, and the correct understanding of the electroencephalographic disorders of patients and the correct treatment of neurofeedback. to be presented.

Laboratory of Sleep Studies

The Sleep Studies Research Center was established under the leadership of Dr. Tahmasian at the Research Institute of Medical Sciences and Technologies and today coordinates sleep studies in the global ENIGMA project. This global project, involving hundreds of neuroscientists around the world, focuses on the study of brain MRI images and their relationship to genetics and clinical signs. The project is centered at the University of Southern California and is led by Professor Paul Thompson. Recently, a sleep study laboratory has been built with a polysomnograph device with 32 electroencephalographic channels and the ability to record other physiological parameters in the research institute.

Laboratory of Clinical Neurophysiology

An electroencephalograph (ECG) device is one of the first devices to record biological signals for studying the human brain. Advances in fast computing by high-powered computers today have given this old tool a new role in brain studies. In this laboratory, it is possible to record a maximum of 32 channels of biological waves simultaneously. In addition, the laboratory is equipped with an electromyographic device to record muscle activity, and set the speed of electrical conduction of peripheral nerves. Auditory, visual and sensory evoked potentials can also be recorded in this laboratory. All of these devices are used in clinical trials for physiological evaluations. The laboratory is also equipped with a variety of electrical and magnetic stimulation equipment for the brain. Devices such as rTMS, TDCS, TAC are available in this lab. Many of these devices are also used by doctors for diagnosis and sometimes treatment.

Laboratory of Medical Radiochemistry

Nuclear medicine (diagnosis & therapy) is dependent on radiopharmaceuticals (radiotracers). Radiochemistry is an essential science for development of radiotracers. In this lab we are designing new radiotracers and their production protocols. Moreover, we are developing efficiency of radiopharmaceutical absorption in body which result higher contrast nuclear images.

Laboratory of Medical Electrochemistry

Small, cheap, quick and easy to use are characteristics of electrochemical biosensors for detection and measurement of biomarkers. The challenging part of them is designing selective and sensitive biosensors. In this lab we are working on fabrication/development of new electrochemical biosensors and point of care devices.

Laboratory of Computational Pathology

In this laboratory, we are working on:

- Whole slide Imaging: Develop image stitching and image registration algorithms for 2D and 3D reconstruction of the histological images.
- Detect, diagnose, and predict pathogenesis: Develop image analytics using deep learning methods for cancer diagnosis and grading, quantification for biological samples, and other medical image analysis.

Events and Networks

Iranian Human Brain Mapping Congress

Brain mapping as an interdisciplinary science in which basic science and engineering scientists work alongside physicians is the study of the brain using a set of technologies in which the structure or function of the brain is shown as a multidimensional map. The benefit of these maps is to facilitate a better understanding of the relationship between the structure, function, genetics, or chemical composition of the brain. The information captured from the brain by devices such as MRI, PET, MEG, EEG, TMS can be combined with different clinical or laboratory data to answer different questions.

The IMSAT is the flagship of brain mapping science in Iran. It has been holding the largest brain mapping congress in the country with the participation of some of the world's most prominent scientist in this field from European and North American countries every year since 2014. The

result of these activities has been the conclusion of international contracts, scientific collaborations, student and professor exchanges with some of the best research centers.

International Collaborations and Networking

Due to the fact that all the faculty members of the IMSAT are Iranian elites graduated from top universities in European or North American countries, strong international connections between the IMSAT faculty members and scientific centers abroad are the characteristics of the IMSAT.

There are several memoranda of understanding for scientific cooperation with universities in France, Denmark, the UK, the Netherlands and Germany. Exchanging students and faculty members, holding scientific conferences, collaborating on research projects, launching joint PhD programs, and obtaining research funding from international organizations are some examples of the provisions of our memoranda of understanding with these international centers. Some of our partner centers are:

- University of Southern California: Global Enigma Project - Department of Sleep Studies

- University of South Denmark: Collaboration in conducting joint research in imaging, teacher-student exchange, joint master's and doctoral courses
- IMT Atlantique - Campus of Nantes, cooperation in conducting joint research, exchange of professors and students, joint training courses in master's and doctoral degrees
- University of Groningen, the Netherlands, collaboration in joint research, professor-student exchange
- Max Planck Institute Tübingen, Germany: Collaboration in joint research, faculty-student exchange
- Ulysses Research Center, Germany: Collaboration in joint research, professor-student exchange
- University of Düsseldorf, Germany: Collaboration in joint research, professor-student exchange

Resources

National Brain Bank of Iran

The brain bank is an important research infrastructure for collecting, storing and studying brain tissue and the nervous system. Extraction of these tissues from the body of the deceased is possible only with his permission during his life or with the permission of the family in the first place. These brains are obtained from patients suffering from brain or psychiatric illness or normal people (for comparison). In this way, brain tissues from various diseases are provided to scientists and researchers to research and unravel the secrets of the brain. The kernels are stored in formalin or at temperatures below 80 degrees. All brains are examined pathologically for a definitive diagnosis. All clinical information and lifetime imaging of patients are also collected to determine the association of clinical symptoms or imaging with pathological changes in the brain. In Iran, all consent and autopsy operations are performed only by the centers of the country's forensic medicine organization.

In 2016, the Research Institute of Medical Sciences and Technologies became responsible for establishing the National Brain Bank of Iran through separate agreements with the Ministry of Health and Medical Education and the Forensic Medicine Organization. This bank is equipped with the financial support of the Deputy Minister of Research and Technology of the Ministry of Health and the Forensic Medicine Organization. All activities of the National Brain Bank are approved and supervised by the National Committee of Medical Ethics.

Targets:

1. Meeting some of the country's research needs in neuroscience
2. Preservation of brain tissue for research studies and medical education
3. Providing brain tissue for scientific use by researchers and scientists in the country
4. Educate researchers, and specialists in the proper use of brain tissue
5. Establishing international relations to upgrade the scientific level and transfer new technologies in cellular-molecular sciences to the country

The bank is governed by a scientific council. All questionnaires, instructions and work regulations in the bank will be applicable after approval by the Scientific Council. All tissue applicants send their application to the bank. The Scientific Council reviews the request and announces the result. All research projects are subject to the approval of the ethics committee. The Scientific Council monitors the process of using the tissue and the information obtained from it.

People who are interested in donating their brain after death to the National Brain Bank of Iran can contact the office of this bank. The National Brain Bank of Iran invites all researchers in the country to cooperate and provides them with its facilities.

Clinical Research Center

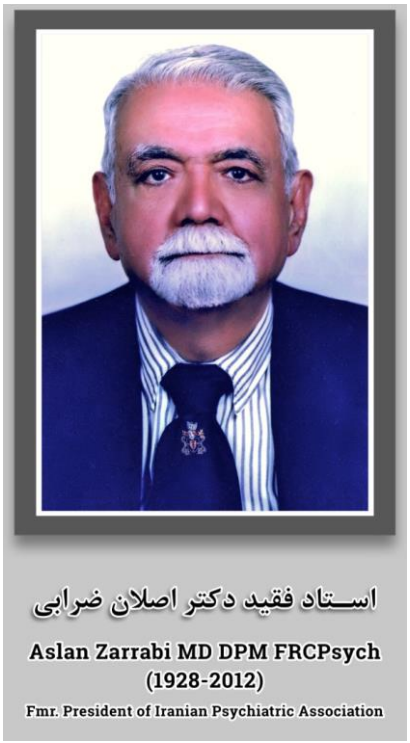
It is essential to examine patients and give them an advice in the clinical research projects. For this reason, the research institute has established a special clinic to visit patients. It is important to evaluate patients' clinical signs and their relationship to biomarkers in the blood or changes seen on imaging. In this clinic, patients are examined clinically and relevant information is obtained from them to use in the research. Each physician from the research institute visits patients in this clinic based on their clinical expertise and research interests. The facilities of this clinic can be used by researchers who are outside the SBU.


This group is responsible to evaluate new medical technologies and use them in the research institute. In this group, medical specialists work with the engineering group to solve health problems, test technology or discover new applications of existing technologies. The use of inventions and innovations that engineers create for use in the health system is not possible without clinical evaluation of the patients. Most engineering projects are started from the beginning in consultation with the doctors of the research institute and during several meetings. Sometimes physicians work with engineers to find new applications for an existing technology. For example, MRI machines are available in many parts of the country today, but medical engineering research in this field finds new applications for diagnosing or monitoring the disease. In some research projects, physicians combine clinical information with laboratory and imaging information and examine their relationship to each other, making it possible for biomarkers to predict the course of disease. In some other projects, cellular-molecular studies on tissue and its association with diseases are investigated.

The physicians in the clinic are:

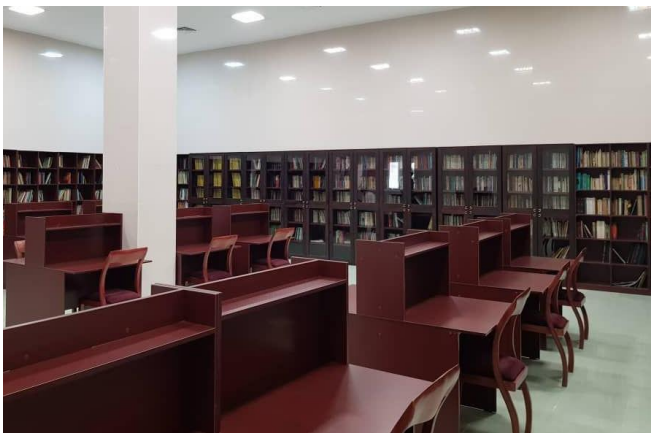
- Dr. Mojtaba Zarei, Professor of Neurology from London
- Dr. Saeed Mahmoudian, Associate Professor of Hearing Sciences, Iran University of Medical Sciences
- Dr. Musa Attarzadeh, neurologist from Tehran
- Dr. Amin Jahanbakhshi, Assistant Professor of Neurosurgery, Iran University of Medical Sciences
- Dr. Afsaneh Tajer, psychiatrist and specialist in learning disabilities and epilepsy from London
- Dr. Hamid Reza Rakhsat Yazdi, Neurologist, Shahid Beheshti University of Medical Sciences

Library of Professor Aslan Zarrabi



The library of the IMSAT was established by the family of the Professor Aslan Zarabi. He was one of the brilliant psychologists in the country. He was born in 1928 in Kashan. Due to his great interest in acquiring science and tourism, he spent his high school in France and after returning to the country, he received a degree in general medicine in 1952 from the medical school of the University of Tehran. The professor went to England to continue his scientific degrees and obtained a specialized diploma in psychiatry from the Royal College of Physicians in London in 1344 and became the first Iranian to become a distinguished member of the Royal College of Psychiatrists of England. During his years in the UK, Dr. Zarabi took on various clinical responsibilities at various levels up to the consulting level of various centers such as Moodlesley Psychiatric Hospital, London National Neurological Hospital, University of Southampton Psychiatry, and University of Edinburgh Psychiatry. And a scientific member in the psychiatric addiction department of San Francisco, etc. Eventually, the atmosphere of Yaran Pars and the people of this Pakbum prompted him to return to his homeland and devote the rest of his life to serving science in Iran .

Responsibilities of Dr. Zarabi in Iran: Director of Azgol Hospital (Workers' Social Insurance (1344-50); Director of Razi Hospital and Psychiatric Center (1350-13); Founder and Head of Mental Health Office in the Ministry of Health 1353 2001), and was the President of the Iranian Psychiatric Association for two terms, official membership in French-speaking associations and congresses of psychiatry and neurology; member of the French Psychiatric Association; member of the High Council of Welfare Addiction; Nerves of the University of Social Welfare and Rehabilitation Sciences; presenting hundreds of articles in conferences and scientific journals in Iran and many countries; teaching exceptional children in Iran since 1346 is one of the scientific and educational services of this late professor. He studied books on history, religions, philosophy, literature, psychiatry, and neuroscience, and therefore had a collection of valuable books in his personal library. And they were his loyal friends Redand and he also established a library named after him in the Research Institute of Medical Sciences and Technologies thanks to the efforts of the professor. May students use this library to remember the deceased and, like him, take steps to teach science and serve Iran.



Center of Medical Innovations and Technologies

This center, which is located in the building of the Research Institute of Medical Sciences and Technologies, has been established in cooperation with the Development Center of Shahid Beheshti University to promote knowledge-based activities as soon as possible. In this marker, all researchers and students can test their idea by presenting a technological design. Their activities are carried out under the supervision of faculty members of the Research Institute of Medical Sciences and Technologies. This pre-accelerator period allows the technologist to test his idea on the plant, and if there is any hope of achieving a product, he will be transferred to the growth center on the recommendation of the research institute and will receive the necessary funds to advance his activity.

Computer Center and Server

Medical data, especially medical signals and images, have high computational complexity that even a multi-core computing machine may not be able to solve. Combining multiple multi-core computing machines called clusters tries to solve problems with high computational complexity. Using all or some of the cores in these clusters simultaneously is known as High Performance Computing (HPC). In recent years, due to the growing number of problems that are impossible or very time consuming to solve with traditional machines, the role of fast processing and specifically high-power processing has become very prominent. Fast processing has made it possible to provide solutions for mass data analysis. Such a capability can make to significant advances in various fields of medicine.

The IMSAT provides permission exclusively to students and researchers to use HPC server for their data analysis. Dr. S. Noorzadeh is responsible for HPC server in the institute.

SARMAD fast processing system: Sarmad processing cluster has 10Tera Flaps processing power. This processing system includes inhomogeneous processors from a combination of powerful CPU and GPU processors. GPUs connected to this system include two GPUs with Tesla architecture called K21 Which has 2822 processors per processor. The processing power of these GPUs is equivalent to Tera Flaps 4 in processes and has a processing power of 0 Tera Flaps in Double precision (DP) processing. This cluster consists of 12 processing nodes with 10 Tera Flaps processing power, which includes powerful CPU and GPU processors. There are also two servers equipped with graphics processors, each of which has a Tesla architecture called the K20X. The processing power of these GPUs is equivalent to 4 Tera Flaps in Single precision processing and has a processing power of 1 Tera Flaps in Double precision processing.

Facilities

Special attention to the health and well-being of students, staff, and faculty has been taken in to account. That is why we have provided some amenities.

- Student Room: Next to the library of Professor Aslan Zarabi, there is a room with water house facilities for students to relax, make tea and coffee, a refrigerator, shelves for personal belongings and furniture. The responsibility of maintaining these devices and facilities lies with the students themselves.

- The council room with audio-visual facilities is located on the first floor for meetings of up to ten people. If you need to use this room, please contact the office manager in the first-floor office
- Amphitheater placed the research institute on the ground floor with a capacity of 56 people and audio-visual facilities. If you need to use this hall, please refer to Ms. Habibi in the administrative section.

- Fajr University Pool is located right next to the building of the Research Institute of Medical Sciences and Technologies. All students, faculty members and staff of the university can use the facilities of this pool at a discount.
- The sports field, including athletics, football, tennis, etc., is located in the southwestern part of the university and can be used by students and university staff in coordination with the relevant authorities.
- IMSAT has held dozens of specialized courses and short-term workshops to educate students and colleagues in the fields of medical science and technology.

We ask all users of university facilities to maintain the university and its facilities as your home.

Contact us

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