

UT Newsletter

Issue 2, Apr - May 2021

UT (University of Tehran) Newsletter is a free monthly newsletter that brings the University of Tehran's developments (Research, Innovations, and Events) and its diverse culture to inboxes across the world.





UT Newsletter Issue 2, April-May 2021

- Managing Director & Editor-in-Chief: Abbas Ghanbari Baghestan (PhD)
- Internal Manager: Mina Rasti
- News: H. Mirzaee and S. Davarifard
- Compiler(s): Mansoureh Asbari and Zohreh Ramezani Doustkouhi
- ▶ Translators: Maryam Khorasani and Shahed Valadbeigic
- ▶ Translation Supervisor: Dr. Maryam Soltan Beyad
- ▶ Photographer(s): Farshad Zohali, Akbar Pourbagher Moghadam, and Abolfazl Rajabian
- ▶ Compositor and Typesetter: L. Eskandarpour
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- Address: UT Central Administration, 16 Azar St. Tehran, Iran.
- ▶ Tell: 61113417, 66419831, E-mail: Publicrel@ut.ac.ir, Website: www.ut.ac.ir/en

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Main News

■ "Universities in the Context of Covid-19":
President of UT Discusses Digitalization of
Higher Education during Pandemic



On April 26, the University of Tehran and Tomsk State University hosted a joint webinar entitled "Universities in the Context of COVID-19: The Experience of Iran and Russia". In this meeting, Dr. Nili Ahmadabadi, President of UT, discussed UT's achievements and the significance of social responsibility during the coronavirus pandemic.

After giving a brief introduction about the University of Tehran, Dr. Nili Ahamadabadi specified the adaptive measures taken by UT in response to the COVID-19 crisis. As Dr. Nili Ahmadabadi stated, due to UT's strong e-learning infrastructure, all university units were able to switch to virtual teaching within the course of only one week. Tablets and free internet access were provided for UT students, and services such as free counselling were offered.

As was indicated by Dr. Nili Ahmadabadi, in addition to implementing remote learning strategies, UT has tapped its resources to design and produce rapid test kits for COVID-19. UT affiliates have been involved in building ventilators for COVID patients, designing and producing electromagnetic face masks, and developing microfluidic systems. Many have also collaborated on developing a vaccine for the

disease.

Dr. Nili Ahmadabadi concluded his speech by thanking the hosts of the webinar and expressed hope that the two universities further expand their collaborations.

➤ Tomsk State University President of National Research: TSU Willing to Expand Collaboration with UT; President of UT Invited to Visit TSU



In the first joint webinar held by the University of Tehran and Tomsk State University, the TSU President of National Research expressed interest in expanding scientific collaborations with the University of Tehran.

Indicating TSU's emphasis on the necessity of providing science-based education, Prof. Georgiy V. Mayer referred to TSU as a follower of Dmitri Mendeleev's philosophy regarding the importance of establishing a science-based educational doctrine.

With its high rankings and a diverse international student community, TSU also has two Nobel laureates among its affiliates.

After inviting Dr. Nili Ahmadabadi to attend TSU's 45th anniversary, Prof. Georgiy V. Mayer concluded his speech with a quotation by the French writer Antoine de Saint-Exupéry: "There is no hope of joy except in human relations".





Dr. Hossein Hojjat, Faculty Member at the UT School of Electrical Engineering, collaborated with Cornell University, Yale University, and Infosys to design and implement Avanir, a synthesis engine for software defined networks.

The collaboration on Avenir started in spring 2019, and the findings were presented at the 18th USENIX NSDI '21, the Symposium on Networked Systems Design and Implementation. You can find Cornell University's report on this project here.

Related links: https://www.cs.cornell.edu/information/news/newsitem11609/cornell-cs-researchers-collaborate-infosys-avenir-and-present-usenix

➤ The UNESCO Chair on Interdisciplinary Research in Diabetes, signs Agreement with Mashhad University of Medical Sciences

An agreement was signed between The UNESCO Chair on Interdisciplinary Research in Diabetes



(Institute of Biochemistry and Biophysics, UT) and Health Related Basic Sciences and Human Nutrition Centre (Mashhad University of Medical Sciences). The agreement calls for the expansion of scientific and educational collaborations between the two parties. Some of the objectives of this agreement are as follows:

- Expanding collaborations with scientists from the Islamic World
- Preparing for and hosting an international conference entitled "Nutrient Lifestyle and Stress Management"
- Planning for expanding collaborations with Organisation of Islamic Cooperation's Standing Committee on Scientific and Technological Cooperation (COMSTECH)
- Designing and developing (inter)national plans for organizing workshops, conferences, and sabbatical opportunities for university students, researchers, and postdoctoral fellows.
- ➤ For the First Time in the Country

 Employing the Measurement Method

 of Electrochemical Noise to Monitor

 and Control Corrosion of Oil and Gas

 Pipelines at UT



The researchers of UT managed to employ a method to measure electrochemical noise and monitor and control corrosion of oil and gas pipelines for the first time in the country. In this method, noise is measured through analysis of

automatic oscillations of the potential and electric current in a corroding metal which is in a nonpolarized status.

According to UT Vice-Presidency of Research, this achievement is the result of efforts of the research group of UT School of Metallurgy and Materials Engineering led by Dr. Saeed-Reza Allah-Karam. Dr. Saeed-Reza Allah-Karam, full professor of UT School of Metallurgy and Materials Engineering, elaborated on the significance of this invention and asserted, "Corrosion in industries is a crucial issue that results in imposition of considerable annual costs and, in some cases, fatal or natural mishaps. Pipelines and reservoirs are among major sources of massive losses in the oil and gas industry. With over one hundred thousand kilometers of oil, gas and water pipelines, Iran has one of the highest traffic densities of pipelines in the region.

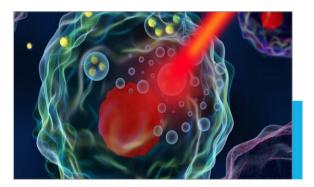
UT professor Dr. Allah-Karam then added, "In principle, electrochemical noise is regarded as the accidental nature of process of corrosion. Such transformations which stem from speed of fluid motion, temperature alterations, PH and also the chemical composition of fluid, in a positional way, cause a reduction in physical properties and endurance of metals against corrosion. Positional corrosions then lead to formation of holes through creation of noises in the potential and the current of the metal. Burgeoning and development of holes and cracking through protection layers could also be the cause of electrochemical noises. As a result, the nature of corrosion, especially positional corrosions which are among the most effective factors in destruction of equipment such as pipelines, is recognized in this method of measurement of oscillations. It is also worthy to be advised that other methods of monitoring positional corrosions are very limited and costly.

The supervisor of research team of this new invention asserts that the most significant applications of measurement methods of electrochemical noise include:

- Monitoring and controlling the corrosion
- Determining the mechanisms of corrosion
- Studying special procedures of corrosion
- Optimizing the amount of injection of deterrent materials to maintain corrosion

Dr. Allah-Karam then added that this method has been applied online for the first time to optimize amount of injection of deterrent materials and maintain corrosion of the gas pipeline from Phase 6 to Phase 10 of South Pars Gas Company in Asaluyeh. It has also been employed in Sar-Khun and Qeshm refineries and the equipment were fully designed and manufactured domestically by the academic team. In the end, it is worth mentioning that this research plan was initiated in 2013 and the equipment were employed in gas pipelines following the process of design and completion of its manufacturing.

№ Method to Terminate Cacerous Cells: examined in a modeling study Thermotherapy



The researchers of UT Faculty of New Sciences and Technologies managed to examine the impact of Thermotherapy on termination of cancerous cells in a modeling study. Thermotherapy or Hyperthermia is one of the treatment methods for cancer in which the body temperature is increased up to 45 degrees Celsius. The researches have demonstrated that high temperature can tear down the cancerous cells and terminate the tumor via harming the proteins and the intercellular

structure. This method of treatment is currently being studied and tested and it has not yet been applied publically.

To perform Thermotherapy, warmth could be created through various ways including injection of a solution of magnetic nanoparticles in the tumor area and placing it in a magnetic field. The expenses of experimenting such tests inside the body of an alive species to investigate the influence of Thermotherapy are high. It is therefore customary to perform a modeling study prior to the main test to reduce costs. As a result, the researchers of UT have speculated the conditions to employ this method inside the body of alive species through implementation of a modeling study using the empirical data from experiments outside the body of alive species. Modeling study could considerably increase accuracy to speculate what happens in reality and provide better results for the researchers.

The studies indicate that the in-vivo endures heat up to 40 degrees Celsius. As the temperature rises above 43 degrees Celsius, the in-vivo gradually begins to tear down. In 50 degrees Celsius, the in-vivo is ready for complete termination. To terminate the tumor in this method, the temperature of the tumor area could be increased and maintained at 50 degrees Celsius for a certain period of time. It should also be noted that the temperature should be controlled to prevent the surrounding tissues from getting wounded.

The findings of this modeling study demonstrate that injection in the center of the tumor area could result in a more efficient treatment and much less harm to the healthy tissues of the skin due to the equal dispensation of temperature. Furthermore, temperature of a more extensive bulk of the tumor will reach 42 degrees Celsius and a more effective treatment will be achieved if the injection is not implemented all at once and it is carried out in less amounts and

within various parts of the tumor. If the physicians prescribe, temperature of the solution could be matched with that of the body prior to injection and the treatment will be faster and less time will be required for Thermotherapy. As a result, it is advised to measure temperature of the solution to that of the body before the injection, considering the trivial poisonous nature of nanoparticles, to prevent possible pains, scald in the area of Thermotherapy and reduction of the treatment time for welfare of the patient.

The researchers of this study recommend that the modeling study for injection in various amounts should be implemented in a few months in order to arrive at the ideal injection spots and the optimized amount of the solution. A more accurate physical geometry of each patient could also be considered via scrutinizing the condition of the patient and employing medical imagery. The procedure of the treatment will then be speculated considering the type, size and location of the tumor.

Ms. Fatemeh Naghdabadi and Mr. Bahman Vahidi, researchers of UT Faculty of New Sciences and Technologies, have taken part in this research. This study has been performed based on the approved M.A. thesis of UT and its findings have been published in a scientific journal titled: "Analysis of effect of Thermotherapy on cancerous tissues using magnetic nanoparticles" in the scientific and research magazine of Yazd Shahid Sedoughi University of Medical Sciences in April of the current year.

■ UT Professor's Invention Granted Patent by United States Trademark and Patent Office

Dr. Roham Rafiee's "nanocomposite coating for antenna reflector and methods of making same" has obtained a patent from the United States Trademark and Patent Office.

Developed by Dr. Rafiee, Associate Professor at The UT Faculty of New Sciences and



Technologies and Director of the Composites Research Laboratory, this coating can generate electromagnetic conductivity in composite antennas. The abstract of the invention's patent reads:

The invention discloses present nanocomposite coating composition and coating method for antenna reflector. The nanocomposite coating composition comprises a polymer matrix resin and a plurality of graphene nanoparticles. The plurality of graphene nanoparticles is added to acetone solvent and dispersed using an ultrasonic disperser. An appropriate amount of prepared epoxy resin is added to the mixture of graphene and acetone solvent and stirred using a mechanical stirrer for certain period. The sonication process is applied to the graphene incorporated resin mixture for a duration of about 30-120 minutes. The acetone in the mixture is removed using a magnetic stirrer and a vacuum oven. Further, same hardener is added to the mixture and degassed using vacuum oven to form the nanocomposite coating composition. nanocomposite coating composition converts an electromagnetically insulated antenna into an electromagnetically conductive antenna for enhancing one or more electromagnetic characteristics of the antenna reflector.

It is noteworthy to mention that the Composites Research Laboratory was launched by Dr. Rafiee in Spring 2011. For more information about Dr. Rafiee's invention, please click here.

https://news.ut.ac.ir/fa/news/16274Dr. Roham Rafiee's "nanocomposite coating for antenna reflector and methods of making same" has obtained a patent from the United States Trademark and Patent Office.

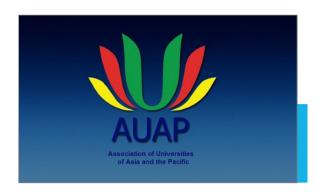
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■ UT President and Six UT Faculty Members Appointed as Members of AUAP Specialized Committees



Dr. Peter P. Laurel, President of AUAP, has designated the UT President and six UT faculty members as members of AUAP specialized committees. The appointments are as follows:

- Dr. Mahmoud Nili Ahmadabadi as Chair of Digital Transformation Committee
- Dr. Abbas Ghanbari Baghestan as Member of Communication Committee
- Dr. Mohammad Hossein Sarrafzadeh and Dr. Mohammad Bagher Ghahramani as Members of Country Chapter Committee
- Dr. Mahdi Pourfath as Member of Research and Innovation Committee
- Dr. Abbas Bazargan as Member of Quality Assurance Committee
- Dr. Omid Fatemi as Member of Digital Transformation Committee

The Association of the Universities of Asia and the Pacific (AUAP) is a Non-Governmental Organization aiming at expanding academic, cultural, and social collaborations between its members. The Association's mission is "to be the effective voice of universities in Asia and the Pacific region".

It is noteworthy to mention that Dr. Nili Ahmadabadi. President of UT, served as the President of AUAP from November 2018 to December 2020.

➤ The MOOC Courses of UT Have Been Announced in Various Categories

The Office of Public Relations of UT declared that the MOOC courses will be held in various categories in the form of Free Training. The MOOC courses of UT have been presented in the fields of IT, Programming, Business Management, Human Sciences and Official Academic Courses in the fields of Mechanic Engineering, Industrial Engineering, Electronics and Computer Engineering, The Basic Sciences, Management, Sports Sciences and etc. The highlighted official courses derived from the approved academic syllabuses which have been presented in form of the MOOC courses are listed subsequently:



- Management of Entrepreneurship Teams by Dr. Mohammad Azizi
- The Neural Networks and Deep Learning by Dr. Kalhor
- Principles of Simulation and Computer Optimization by Dr. Mohammad Sheikh Alishahi
- Physics 1 by Dr. Hamid Reza Moshfegh
- Physics 2 by Dr. Somayeh Mohammadi
- Micro-Controller by Dr. Seyed Omid Fatemi
- E-Learning by Dr. Seyed Omid Fatemi
- Designing and Developing the New Product by Dr. Mohsen Hamedi
- Non-Linear Systems by Dr. Mohammad Javad Yazdan Panah
- Electrodynamics by DR. Hamid Reza Moshfegh

 An Introduction to Sports Biomechanics by Dr. Elham Shirzad

- ...

Those interested can use the following link to access the full list of courses: MOOC.UT.AC.IR

It is also worth mentioning that the MOOC courses of UT will commence in late May.

▶ Mexico's Ambassador to Iran Meets with Dean of Faculty of World Studies



On May 17, 2021, His Excellency Mr. Guillermo A. Puente Ordorica, Mexico's new Ambassador to Iran, met with Dr. Mohammad Samiei, Dean of the Faculty of World Studies.

The meeting was arranged by Dr. Maryam Haghroosta, Head of the Research Center for Hispanic Studies at FWS. Also in attendance were Dr. Amirbahram Arabahmadi, the Faculty's Advisor for International Affairs, and Profirio Martinez Morales, Deputy Head of Mission at the Embassy of Mexico.

In this meeting, Mr. Ordorica was introduced to FWS and its various activities. A new agreement between FWS and the universities of Mexico was signed, and the previous agreements were renewed. The two parties also discussed developing exchange programs for faculty members and students, enhancing their academic and cultural cooperation, as well as organizing joint meetings, conferences, and commemorations.

The meeting was closed with Mr. Ordorica's visit to several units of the Faculty, including the FWS's library. The two parties also talked about plans for upgrading the Spanish section of the library.

➤ Assessment of Physical condition of the Cattle Using a Smart Science-Based System



A science-based company has designed and produced a smart system to weigh and assess physical condition of the cattle using the Internet of Things. Ali Farzian, the executive manager of a science-based company which is located in the Science and Technology Park of UT, stated: "Our company initiated its activities in the field of Internet of Things and we are currently studying the required equipment for smartification of lactating livestock." He added, "Seven products which are required in the industry of animal husbandry have been manufactured so far based on the Internet of Things in this company. As a result, the dependency of animals on humans has reduced and all manufactured products can be installed on the platform of Internet of Things." Farzian continued, "The smart system of weighing and assessing physical condition of the moving cattle is only one of the productions of this company." He then explained, "Currently, the animal husbandry ranchmen have to tie down cows to measure their weight since the cattle shouldn't move in the process. However, in order to weigh the cattle in our system, the cow is only



required to walk through the equipment."

He also pointed out that this system consists of two sections including a smart monitor that weighs and evaluates the movement status of the cattle and it separates and dispenses the livestock through analysis of their manner of treading as they pass through. This system also possesses a smart camera which monitors physical and movement status of the cattle and it automatically evaluates and presents physical and movement score of the livestock as they move. Farzian explicated that this data is transmitted via online wireless connections to the science-based software so that the animal husbandry managers and physicians can access it. Since all the assessments are implemented as the cattle move, it is easily possible to evaluate physical condition of the livestock constantly with appropriate positioning of equipment in the farm. This technologist asserted that the information acquired from this assessment provides possibility of timely attendance to the cattle and the herd from the veterinary point of view of and with regard to welfare of the livestock and the managerial affairs of the farm.

He further affirmed that this smart system of dispensation and assessment of physical status of the cattle is able to allocate livestock as they move, and through video, evaluate their physical score, assess their movement score, identify lameness and transfer data of assessments which are accessible via mobile phones and computers. In case of lameness, the system recognizes the issue since it is an essential matter in animal husbandry.

In the end, Farzian revealed that a camera can be installed on this equipment as it is important for the cattle to move in a straight line when their weight is being measured. Using this camera, physical score of the cattle, which is similar to Human BMI, is distinguished. Normally, the veterinary physicians visit the farm every three weeks and report this figure which is between

1 and 5. Performing this task is costly as the physician's fees are high especially if one pays such fees every three weeks. Human error is also likely in the normal procedure. As a result, employment of this new technology can reduce costs considerably.



Dahian Pezeshki Pishro, a medical device company based in The UT Science and Technology Park, has successfully developed a device for treating diabetic foot ulcers. According to the company's research and development manager, the device can shorten the healing period of diabetic foot.

Dahian Pezeshki Pishro, which specializes in importing and producing medical equipment, has also marketed its six-channel ECG machine. Among the other products designed and implemented by the company are automated external defibrillators (AED) and Holter monitors. The researchers at the company have been recently working on developing a device for treating diabetic foot ulcers.

Mr. Ali Heidarnejad, Dahian's Research and Development Manager, indicated that the device is now in the process of obtaining a license from Iran's Ministry of Health and Medical Education. As he remarked, while it usually takes diabetic foot ulcers up to one month to heal, the device designed at Dahian can shorten this period through providing electrical stimulation to the affected area.

▶ UT to Participate in the First International Blockchain Conference on Cryptocurrencies and World Economy



On August 6, 2021, the First International Blockchain Conference on Cryptocurrencies and the World Economy will be held with the aim of providing academics, students, and researchers with an opportunity to discuss their knowledge, experiences, and achievements in the field of blockchain technology.

This international event will host several predominant scholars and experts. Iran's top universities, as well as several other international research institutes, will participate in this conference.

Articles are to be submitted for consideration by July 20, 2021. For more information about the conference, please head to the conference website: http://www.unescoconf.ir/en/

▶ Harvard's Gisela Striker in 7th Webinar of Interdisciplinary Philosophy

The University of Tehran held a series of webinars in The UT Faculty of Theology and Islamic Studies, hosting prominent scholars specializing in interdisciplinary fields of philosophy.

In these webinars, Dr. Nadia Maftouni, a preeminent Iranian philosopher, author, artist,

and senior research scholar at Yale Law School, had a discussion with these scholars about their achievements.

On May 19, Harvard's Gisela Striker will speak about Peripatetic Philosophy in the 7th event of this webinar series.

On May 5, 2019, Bruce Ackerman talked about Philosophy of Law. On December 17, 2020, Dudley Andrew discussed Philosophy of Cinema. Dimitri Gutas spoke about Avicenna and Philosophy of Philosophy in two conferences held on November 19, 2020 and March 14, 2021. On January 28, 2021, Robb Moss talked about Philosophy of Life. On April 11, 2021, Nicholas Rescher discussed Philosophy of Science.

David Bordwell, Kristin Thompson, and Slavoj Zizek will participate in the following conferences.

☑ The Most Unique Museum of Zoology in Iran



The Museum of Zoology in the Pardis College of Agriculture and Natural Resources was founded in 1928 by Jalal Afshar, Professor of Plant Medicine in the Pardis College of Agriculture and Natural Resources of UT, in a building with a historical architecture in the city of Karaj. This historical building is located in the southern gate of the Pardis College of Agriculture and Natural Resources of UT in Shahid Khorasani (Mesbah) Ave.

The Museum of Zoology of Pardis Campus contains interesting collections of various animal



species including mammals, birds, reptiles, aquatics, insects, noxious and useful species for agriculture besides which the procedures and methods of challenging the insects are exhibited. This museum currently possesses 17 halls in two stories that are divided into the public and scientific sections and it accommodates a collection of diverse animals, posters, photos and various moulages of anatomy of internal and external organs and etc.

► University of Pittsburgh appreciates UT's webinar in Honor of Pitt's Nicholas Rescher



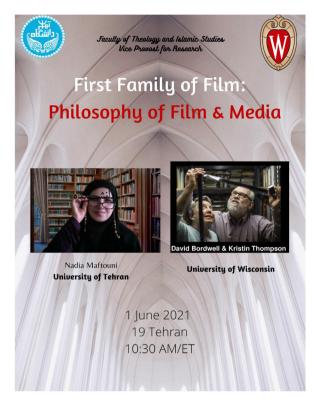
The University of Pittsburg appreciates the UT's webinar in Honor of Pitt's Nicholas Rescher on April 22, 2021.

Pitt's Nicholas Rescher, now 92 years old, is a German-American philosopher, polymath and author, teaching at the University of Pittsburgh.

He is chair of the Center for Philosophy of Science and was formerly chairman of the philosophy department in the Kenneth P. Dietrich School of Arts and Sciences.

In the webinar, Nadia Maftouni, a prominent Iranian academic, author, artist and Yale senior research scholar hosted Rescher and talked with him about his achievements.

Maftouni said: "Rescher's 'A Journey through Philosophy in 101 Anecdotes' is an actually successful framework to reach a broader audience in the field. At first glance it seems easy to write. But at least in philosophy, it's easy to write in a complicated style and it's hard to write in a simple, clear and readable fashion."









Rooted in Jondi Shapur University which goes back over 2,000 years, UT was established in 1851 and ratified in 1934 as a first modern and comprehensive university in Iran. From the outset, the UT bore the title of the "Quintessence of Higher Education in Iran".

