Pedagogical frontline—VR course with Harvard P. 10

Running app: new way to promote exercise P. 07

How a circadian output circuit controls sleep-awake arousal P. 09
As the fall is in full swing, we embrace each challenge with great vitality. Inspiring breakthroughs are seen in the field of genetics, neuroscience and clinical studies. Our scholars and students shine brightly on the global stage. And you may find it refreshing that smart technology has made a difference to campus life: running app helps students to break a sweat, and VR technology brings people to the Pyramids of Giza in an instant.

I am also proud to share with you ZJU’s leap in world university rankings. With a global vision and concrete actions, we are committed to an innovative and shared future.

Please feel free to share your thoughts with us.

MESSAGE FROM THE EDITOR-IN-CHIEF

LI Min, Editor-in-Chief
Director, Office of Global Engagement

CONTENTS

ZJU NEWSROOM 03
RESEARCH HIGHLIGHTS 08
MOLECULAR IMAGING
SLEEP-AWAKE AROUSAL
SOCIAL DECISION MAKING
SPOTLIGHT ON STUDENTS 10

INTERNATIONAL

What’s happening

- According to the highly-regarded Academic Ranking of World Universities, ZJU is now rated at 67th in the world, a leap from last year’s No. 101–150.
- ZJU rises to No.4 in China and No.101 in the world, according to the latest Times Higher Education World University Rankings.
- On Sept. 14, a Memorandum of Understanding for strategic cooperation was signed between ZJU and Springer Nature, aimed at exploring international cooperation on a broad range of areas.
- On Sept. 24, the Italy Office of ZJU Press was inaugurated in Florence, becoming the first Chinese publishing house to be set up in Italy.
- Reuters indentifies ZJU as one of the “2018 Top 100 World’s Most Innovative Universities”.

ZJU leading scholars attended the Summer Davos

Four leading scholars of ZJU attended the 2018 World Economic Forum’s Annual Meeting of the New Champions (a.k.a the Summer Davos), themed on “Shaping Innovative Societies in the Fourth Industrial Revolution”.

Vice President YAN Jianhua attended the University Leaders Dialogue and engaged in in-depth discussions with presidents of top universities around the globe.

Conference on heritage studies fuels multidisciplinary thinking

The 4th Biennial Conference of the Association of Critical Heritage Studies (ACHS) kicked off at ZJU on Sept. 1. More than 400 scholars from over 40 countries and regions participated in this grand academic feast in heritage studies.

Themed on “Heritage across Borders”, 2018 ACHS embraces a better understanding on how heritage is valued, preserved or destroyed, politicized, mobilized, planned and financed.

ZJU co-chaired an IdeasLab entitled “New Approaches to Improving Mental Health”. Dean of ZJU’s Faculty of Medicine DUAN Shumin, Prof. HU Hailan and Prof. MA Huan shared with the participants their dazzling breakthroughs in the field of brain science.
On Sept. 14, ZJU announced the Convergence Research Project for Brain Research and Artificial Intelligence (AI), referred to as Intelligence Convergence (IC). This is the first project launched in Innovation 2030, a key university-wide strategic framework to advance the "Double First-Class" Initiative.

Rooted in the broad spectrum of disciplines, ZJU IC will explore the convergence and integration between brain research and AI, as well as accelerate the innovation and development of natural sciences and humanities.

A research team led by Prof. GUAN Minxin from the Institute of Genetics “captured” a particular gene for hearing impairment: mtu1. Their discovery that mtu1 mutation triggers deafness may be translated to an effective cure for over 11 million deaf people and the establishment of a pre-warning deafness system.

The study reveals that the genetic defect of mtu1 destroys mitochondria—a source of energy in the cell that the faculty of hearing requires. When mtu1 affects the function of mitochondria adversely, this “power shortage” will lead to auditory dysfunction. The team is currently searching for more deafness-inducing genes among thousands of human genes.
Zhejiang University’s largest movable 3D printed grotto depicts origins of Chinese Buddhist art

Conservationists from the Yungang Grottoes Research Institute and Zhejiang University (ZJU) have created movable replicas of its 3D printed ancient Buddhist statues.

The Yungang Grottoes, a UNESCO world heritage site located west of Beijing near the city of Datong, contains over 50,000 statues, carved into golden sandstone cliffs and displays the origins of Chinese Buddhist art.

The full-size reproduced grotto is 14 meters long, 11 meters wide, nine meters high and weighs less than 5 metric tons and is said to be the world’s largest movable grotto printed by 3D technology.

Zhejiang University and 3D printing
Zhejiang University has demonstrated its understanding of 3D printing technologies through its innovative research. Earlier this year, a group of researchers from the university proposed a new method of 3D nanofabrication by combining ice and electron beam technology to print large-scale metal parts.

Prior to this, Zhejiang University, in collaboration with the University of Birmingham and Stockholm University, identified ultra-mechanical properties in a popular 3D printable steel alloy which can potentially “program” steel molecules to make high-strength, ductile products, for high-performance applications. (3D Printing Industry)

IN THE MEDIA

Chinese university encourages exercise through running app

Students in Zhejiang University, a prominent research university in east China’s Zhejiang Province, have recently been jogging in groups on campus in early mornings, late afternoons and even late at night. They were motivated to put on training shoes and join the fitness trend after the university launched a running app, which monitors the students’ exercise records and helps assess their performance in PE class, Shanghai-based media outlet The Paper reported.

Students are encouraged to jog for at least 2.5 kilometers every running session, and complete the exercise in 12 to 45 minutes. Uploading a selfie is required at the end of each exercise session to validate the record. The new running app was designed by Zhejiang University as part of the school’s effort to reform its PE course system and raise students’ awareness about health and fitness. (CGTN)

Chinese university encourages exercise through running app

Students in Zhejiang University, a prominent research university in east China’s Zhejiang Province, have recently been jogging in groups on campus in early mornings, late afternoons and even late at night. They were motivated to put on training shoes and join the fitness trend after the university launched a running app, which monitors the students’ exercise records and helps assess their performance in PE class, Shanghai-based media outlet The Paper reported.

Students are encouraged to jog for at least 2.5 kilometers every running session, and complete the exercise in 12 to 45 minutes. Uploading a selfie is required at the end of each exercise session to validate the record. The new running app was designed by Zhejiang University as part of the school’s effort to reform its PE course system and raise students’ awareness about health and fitness. (CGTN)
Major breakthroughs in molecular imaging in epilepsy diagnosis and treatment

Recently, ZJU clinical scientists have made much progress in research into precision diagnosis via molecular imaging and worked out a new approach to identifying insidious causes of epilepsy. The research team has devised an effective imaging pathway to assessing the severity of physical conditions of epileptic patients by creating a Positron Emission Tomography (PET) database for cerebral metabolism, adopting techniques such as Magnetic Resonance Imaging (MRI) and electroencephalogram (EEG), and conducting clinical interviews. The success rate of detecting lesions in epileptic children ranges from 15% to 39% according to relevant studies, but PET can elevate the rate to a surprising 79%. The key to pre-surgery detection is the “positioning system” of PET. By comparing the PET image of a patient with the database, scientists are able to identify the volume of the lesion and keep surgeons well-informed of the area that should be removed via a 3D image.

Clinical studies indicate that PET molecular imaging technology can not only reflect the changes in cerebral functions and metabolism, but also play an indispensable role in locating lesions precisely, assessing cognitive damages caused by antiepileptic drugs and performing PET-directed surgery, thereby offering a precise plan for the diagnosis and treatment of epilepsy.

How a circadian output circuit controls sleep-awake arousal

A study led by Dr. GUO Fang in Department of Neuroscience of ZJU’s School of Medicine identified a neural circuit of Drosophila linking circadian neuron APDN1 to the sleep center ellipsoid body EB-R2. The research findings were published in Neuron on September 27.

GUO Fang et al. discovered that the anterior-projecting DNIs (APDNs) “exit” the circadian circuity and communicate with the homeostatic sleep center in higher brain regions to regulate sleep and sleep-wake arousal. This research offers significant clues to the enigma of sleeping.

It is amazing that the identical characteristics different animals display in sleeping can be regulated by the circadian output circuit that controls sleep-awake arousal.

Revealing cognitive dimension of social decision making

CHEN Fadong, a researcher in ZJU’s School of Management and Ian Krajbich, an associate professor in the Ohio State University, co-published an article entitled “Biased sequential sampling underlies the effects of time pressure and delay in social decision making” in Nature Communications.

Understanding the cognitive dimension of cooperative behaviors has become one of the major concerns in management, economics, psychology and neurotics. Through an in-depth experiment, the study indicates that choice biases are magnified under time pressure and attenuated under time delay. Hence, human nature cannot be arbitrarily deemed as good or evil.

CHEN Fadong and Ian Krajbich proposed a diffusion model with biased starting points (biased DDM) to account for the cognitive process of social decision making. This model assumes that if one’s intuition favors selfishness or pro-sociality, the starting point will be biased towards the option of selfishness or pro-sociality respectively. Meanwhile, this research confirms that the biased DDM can mirror intuition remarkably. Model fitting and out-of-sample predictions prove that this model can depict and predict human behavior in a better way.

This research presents a clear picture about the cognitive process of social decision making. Moreover, it highlights the importance of modeling the dynamics of the choice process from the perspective of cognitive processing, thus opening the door to explaining, describing and predicting human behavior.
On Sept. 26, ZJU students “met” their counterparts from Harvard University at “the Pyramids of Giza”, benefiting from an internet connection and Virtual Reality (VR) technology.

“What an experience!” exclaimed Tansi, a Mexican student at ZJU just after taking the VR device off his head. “I am walking around Giza!” He is not alone in his amazement. “While studying with Harvard students is an excitement all by itself, the lectures on recent discoveries at Giza and the best practices of excavation techniques are also great attractions,” says TIAN Zhuowei, a ZJU doctoral candidate.

“The Pyramids of Giza: Technology, Archaeology, History”, a joint archaeology course originally designed by Harvard University is introduced to ZJU classrooms, owing to the great efforts by DIAO Changyu, the initiator and leader of the program.

“The class examines Giza in the context of ancient Egyptian history, art, digital archaeology and visualization,” according to Harvard description of the course, “and we are delighted to add ZJU students to the course by remote video conferencing.”

Now DIAO is expecting further development of ZJU’s VR course. “ZJU is building a brand new VR teaching classroom. And my colleagues at Cultural Heritage Institute have spent years working on the digital documentation of cultural sites in China. Remember, the big screen isn’t just for playing films.”

Pedagogical frontline – VR course with Harvard

Students win Finalists Certificate in 2018 TECO Green Tech International Contest

ZJU students with their design “Leaf for Life—Deciduous Powder 3D Printer” were awarded the Finalists Certificate in 2018 TECO Green Tech International Contest on Aug. 22 in Taipei, China.

The “Leaf for Life” team was headed by WU Jie and YUE Sicong from ZJU’s College of Energy Engineering. This work was completed by seven undergraduates from different majors.

The team developed a deciduous powder 3D printer, through which fallen leaves can be converted into an elaborate work of art. Its economic value will amount to 11 times as large as that of incineration power generation or composting.

Mega-Structure awarded Silver Prize in ARCASIA Student Competition 2018

On Sept. 8, a team from College of Civil Engineering and Architecture won the silver award in the ARCASIA (Architects Regional Council Asia) Student Competition 2018. Their work—“Mega-Structure” shone out amongst more than 40 entries from over 20 Asian nations.

Students were inspired by Changshen High-way, an indispensable artery connecting the north and south of Zhejiang Province. Influenced by their belief that high-speed overpasses can co-exist in harmony with the countryside landscape, the students integrated agricultural and public activities in the space under the viaduct.