China court sentences 7 over falsifying air quality data

A Chinese court Friday sentenced seven people, including the heads of two environmental protection branches, to imprisonments of over one year for falsifying air quality monitoring data.

Xi'an Intermediate People's Court in northwest China's Shaanxi Province convicted the two of interfering in data collection of the automated air quality monitoring system and using cotton to fill the sampling instrument to lower the pollution data, in February and March 2016.

He Limin, then head of Chang'an District Branch of Xi'an Environmental Protection Bureau, and Tang Shixing, then head of Yanliang District Branch under the bureau, ordered staff from national monitoring stations in the two districts to falsify the data, said the court.

The court found them guilty of damaging the computer information system. The court sentenced He to one year and seven months and Tang to one year and five months.

Li Sen and Zhang Feng, then heads of the Chang'an and Yanliang monitoring stations respectively, were given imprisonments of one year and ten months, and one year and seven months, respectively. Three others were also sentenced.

Police: Suspect in east China blast among dead

Forensic experts work at the site of the explosion near a kindergarten in Fengxian County in east China's Jiangsu Province, June 16, 2017. [Photo/Xinhua]

The suspected perpetrator in an explosion that happened on Thursday afternoon in east China's Xuzhou City was among the eight people killed in the incident, police said on Friday.

Police identified the suspect as a 22-year-old man surnamed Xu, a local resident of Quanshan District, Xuzhou of Jiangsu Province.

Police said they have collected evidence and completed DNA matching tests to prove Xu's identity.

Police have found materials for making explosives in Xu's rental apartment, where there are words "death" and "killing" on the wall.

Police said Xu had been suspended from school after he was diagnosed with "vegetative nervous function disturbances." He then found work and lived in the rented apartment.

The explosion left eight people dead, including Xu, and 65 others injured. Sources with the hospitals said Friday that among the eight severely injured, four have escaped life-threatening danger.

The blast occurred around 4:48 p.m. Thursday near the gate of a kindergarten in Fengxian County.

China’s quantum satellite establishes photon entanglement

A team of Chinese scientists have realized the satellite-based distribution of entangled photon pairs over 1,200 kilometers. The photon pairs were demonstrated to be still entangled after travelling long distances.

This satellite-based technology opens up bright prospects for both practical quantum communications and fundamental quantum optics experiments at distances previously inaccessible on the ground, said Pan Jianwei, an academician of the Chinese Academy of Sciences.

The achievement was made based on the world’ s first quantum satellite, Quantum Experiments at Space Scale (QUESS), also dubbed Micius, launched by China on August 16, 2016, and was published as a cover article in the latest issue of academic journal Science.

This experiment was made through two satellite-to-ground downlinks with a total length varying from 1,600 to 2,400 kilometers. The obtained link efficiency is many times higher than that of the direct bidirectional transmission of the two photons through telecommunication fibers, said Pan, who is also the lead scientist of QUESS.

Quantum entanglement is a phenomenon in quantum physics, which is so confounding that Albert Einstein described it as “spooky action at a distance” in 1948.

Scientists found that when two entangled particles are separated, one particle can somehow affect the action of the far-off twin instantly.

Scientists liken it to two pieces of paper that are distant from each other: if you write on one, the other immediately shows your writing.

The mystery of quantum entanglement has been puzzling scientists since it was detected.

Quantum physicists have a fundamental interest in distributing entangled particles over increasingly long distances and studying the behavior of entanglement under extreme conditions.

In theory, this bizarre connection can exist over any distance, but scientists want to see if there’ s some physical limit. “If you want to explore new physics, you must push the limits,” Pan said.

Previously, entanglement distribution had only been achieved at a distance up to 100 kilometers due to photon loss in optical fibers or terrestrial free space.

One way to improve the distribution lies in the protocol of quantum repeaters, whose practical usefulness, however, is hindered by the challenges

of quantum storage and readout efficiency, Pan said.

Another approach is making use of satellite-based and space-based technologies, as a satellite can conveniently cover two distant locations on Earth. The main advantage of this approach is that most of the photons' transmission path is almost in a vacuum, with almost zero absorption and de-coherence, Pan said.

After feasibility studies, Chinese scientists developed and launched QUESS for the mission of entanglement distribution. Cooperating with QUESS are three ground stations: Delingha Observatory in Qinghai, Nanshan Observatory in Xinjiang and Gaomeigu Observatory in Yunnan.

For instance, one photon of an entangled pair was beamed to Delingha and the other to Gaomeigu. The distance between the two ground stations is 1,203 kilometers. The distance between the orbiting satellite and the ground stations varies from 500 to 2,000 kilometers, said Pan.

Due to the fact that the entangled photons cannot be amplified as classical signals, new methods must be developed to reduce the link attenuation in the satellite-to-ground entanglement distribution. To optimize the link efficiency, Chinese scientists combined a narrow beam divergence with a high-bandwidth and a high-precision acquiring, pointing, and tracking (APT) technique.

An accurate transmission of photons between the "server" and the "receiver" is never easy, as the optic axis of the satellite must point precisely toward those of the telescopes in the ground stations, said Zhu Zhencai, QUESS chief designer.

What makes it much harder is that the satellite flying over the Earth at a speed of 8 kilometers per second can be continuously tracked by the ground station for just a few minutes.

"It is like tossing a coin from a plane at 100,000 meters above sea level exactly into the slot of a rotating piggy bank," said Wang Jianyu, QUESS project's chief commander.

The highly sensitive QUESS could make visible from the Earth a match being lit on the Moon, Wang added.

By developing an ultra-bright space-borne two-photon entanglement source and the high-precision APT technology, the team established entanglement between two single photons separated by 1,203 kilometers.

Compared with the previous methods of entanglement distribution by direct transmission of the same two-photon source – using the best performance and most common commercial telecommunication fibers respectively – the effective link efficiency of the satellite-based approach is 12 and 17 orders of magnitude higher, Pan said.

He said the distributed entangled photons are readily useful for entanglement-based quantum key distribution, which, so far, is the only way

to establish secure keys between two distant locations on Earth without relying on trustful relay.

QUESS is also designed to establish “hack-proof” quantum communications by transmitting uncrackable keys from space to the ground, as well as test quantum teleportation with a ground station in Ali, Tibet.

Pan revealed they also want to see if it’ s possible to distribute entanglement between the Earth and the Moon in future.

China on yellow alert for heat wave

China’s meteorological authority maintained its yellow alert Friday, as a heat wave is expected to sweep across many regions of the country.

Temperatures are expected to rise above 35 degrees Celsius in Beijing and Tianjin as well as parts of Hebei, Inner Mongolia, Liaoning and Shandong, the National Meteorological Center (NMC) said.

Some areas will see temperatures reach between 37 and 40 degrees Celsius, it added.

The NMC advised people in affected regions to take precautions against heat stroke and fire.

China has a four-tier weather warning system, with red representing the most severe, followed by orange, yellow and blue.

Teenager ‘robbed to get himself detained’

A 19-year-old sought to have himself sent to a detention house in a desperate bid to overcome his gaming addiction. [File Photo]

A 19-year-old who sought to have himself sent to a detention house in a desperate bid to overcome his gaming addiction has been jailed for two years with a two-year reprieve for robbery.

Putuo District prosecutors said the defendant, identified as Xiaogang, had followed and attempted to rob a young woman surnamed Wang outside her home in the wee hours last November 23. He fled after being told Wang’s relatives were nearby.

On February 12, he followed another woman surnamed Wu and tried to drag her away as she was about to enter her home. She called for help and Xiaogang was subdued at the scene.

He told the court he was a high school student but he had quit schooling because he was addicted to computer games.

He said he came up the idea to have himself detained because he had seen an online post stating detention houses were quite comfortable. And he thought they would enable him to buckle down to study in a place where there would be no access to the Internet.

He expressed regret at causing suffering to the two women.