US falling dangerously behind China on GPS development: Pentagon's former space-policy leader

The Pentagon needs other position-navigation-timing systems if it loses connection to GPS

The United States isn't working quickly enough to replace its aging and vulnerable GPS system, according to the Pentagon's former space policy chief.

"We are falling behind. We aren't modernizing constellation signals fast enough," John Plumb said Wednesday at a GovExec Space Project event.

China is developing a comprehensive and modernized position-navigation-timing architecture that integrates space and ground layers, Plumb said, while the Pentagon relies on about two dozen satellites to guide its planes, ships, and weapons.

"One of the things the [Defense] department is worried about is: you have 24 GPS satellites, roughly, providing all these signals for the whole planet, both commercial [and] civil signals, but also for the military. That's 24 [anti-satellite] missiles that remove that completely," said Plumb, who served for two years as the first-ever assistant defense secretary for space policy until he stepped down in May.

Read more in *article*… https://www.defenseone.com/threats/2024/08/us-falling-dangerously-behind-china-gps-development-pentagons-former-space-policy-leader/399159/
2024-08-29

Galileo prepares for upcoming OSNMA operational declaration

The European Union Agency for the Space Programme (EUSPA) has completed the testing of the Galileo Open Service Navigation Message Authentication (OSNMA) and is now gearing up for its operational launch.

Galileo, similar to any other GNSS, is used by many critical applications in transportation, finance, telecommunications, information technology, energy, utilities, manufacturing, health services, emergency services and law enforcement.

However, the rise in spoofing attacks, which can disrupt these services, has prompted the development of OSNMA. This capability, integrated into the Galileo infrastructure by EUSPA, the European Commission (EC), and the European Space Agency (ESA), aims to enhance the security of GNSS signals.

Read more in *article*…
https://www.spacedaily.com/reports/New_Study_Showcases_Enhanced_GNSS_Accuracy_in_Smartphones_for_Urban_and_Open_Sky_Navigation_999.html
2024-09-03

Galileo satellites enter service after in-orbit testing

Two newly launched Galileo satellites, deployed in April, have now completed successful in-orbit testing and have officially entered service, helping to complete the second of three orbital planes in the Galileo constellation. Each additional satellite strengthens the precision, availability, and robustness of Galileo's navigation signals. The next launch, expected soon, will further expand the constellation, with six more Galileo First Generation satellites scheduled for deployment in the coming years.

Galileo satellites 29 and 30, launched from Cape Canaveral three months ago, have reached their intended positions at an altitude of 23,222 km. After extensive testing, they have been deemed fully operational. Both satellites are part of the same orbital plane, one of three that make up the Galileo constellation. With two of the three planes now fully populated, just one more launch is needed to complete the constellation. The upcoming launch of the next Galileo satellites is planned for the coming weeks from Kennedy Space Center in Florida aboard a SpaceX Falcon 9.

The two new satellites are already active, transmitting navigation signals that enhance system accuracy and contribute to the overall reliability and robustness of the Galileo system.

Read more in *Space Daily* article.
https://www.spacedaily.com/reports/Galileo_satellites_enter_service_after_in_orbit_testing_999.html
2024-09-06

Coroner's warning after sat-nav led to fatal crash

A double fatal crash caused by incorrect audio directions from a sat-nav has prompted a coroner to warn tech companies - including Apple and Google - of a risk of future deaths.

Tracey Haybittle, 58, and Amal Mohamed Ahmed, 38, both died after a head-on collision when Ms Ahmed drove the wrong way down a slip road onto the A5 near Milton Keynes.

She was "following audio directions from her sat-nav application", said Sean Cummings, assistant coroner for Milton Keynes.

He has written to Apple, Google and TomTom to express concerns about verbal commands "likely to confuse" drivers. All have been approached for comment.

https://www.bbc.com/news/articles/c9d13qxq3w9o

2024-09-02

Hundreds Weigh in on FCC NextNav Petition for 900 MHz Band Change

The Federal Communications Commission (FCC) closed its 30-day solicitation period regarding a petition from geolocation technology company NextNav with a total of 744 individuals and companies responses were posted, most in defense of protecting the lower 900 MHz band.

Many of the respondents indicated the change being requested would adversely affect the “Part 15” devices that already use the lower 900 MHz band NextNav is seeking access to, cutting off services that industries such as healthcare, defense, aerospace, retail and tolling rely on.

At issue is a NextNav petition filed in April to the FCC to expand the power level, bandwidth and priority of its licenses in the 902 to 907 and 918 to 928 MHz bands in the United States—a band currently in use by UHF RFID, Z-Wave, Zigbee, LoRa and numerous other wireless technologies. Additionally, NextNav proposes to use 5G connectivity over the relatively low bandwidth.

Read more in *article*…
https://www.rfidjournal.com/news/hundreds-weigh-in-on-fcc-nextnav-petition-for-900-mhz-band-change/221647/
2024-09-06

Bezos plots GPS rival as Putin menaces satellite systems

Billionaire Jeff Bezos is plotting to build a rival to the US military's global positioning system (GPS) amid a dangerous rise in signal jamming since Vladimir Putin's invasion of Ukraine.

Tech giant Amazon is planning to launch thousands of communications satellites – a $10bn (£7.6bn) programme known as Project Kuiper – that will provide broadband signals to remote areas around the globe.

However, the online retail behemoth is now also hiring experts in "global navigation satellite systems" and "position navigation and timing" technology, which are at the root of GPS. Analysts believe it is laying the groundwork to develop an alternative system, which could provide a backup to the military-grade network if it is knocked offline or jammed by hostile powers.

Read more in article. https://www.yahoo.com/tech/bezos-plots-gps-rival-putin-140000986.html
2024-09-14

Russians have set up a GPS jamming system near Novorossiysk

Russians have set up a GPS jamming system near the Gelendzhik port in Novorossiysk.

This was reported by OSINT analyst H.I. Sutton.

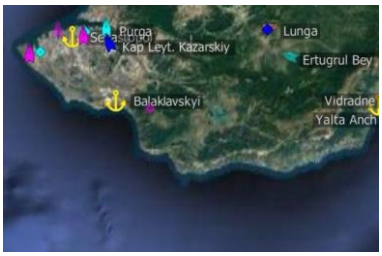
The analysis utilized data from the Automatic Identification System (AIS), which is used in civilian shipping.

The analysis of the AIS system revealed that the location of Russian ships differed from their actual positions.

According to the analyst, the jamming is concentrated around Russian marker buoy No. 133, causing the location of ships using the Global Positioning System (GPS) to show incorrect positions.

The GPS jamming system is aimed at countering the reconnaissance activities of Ukrainian intelligence services, preventing the accurate detection of ship locations in the port through spoofing.

Read more in *article*…
https://odessa-journal.com/russians-have-set-up-a-gps-jamming-system-near-novorossiysk
2024-09-16



NAVFEST: 20 Years of Cost-Effective GPS NAVWAR Testing

The 746th Test Squadron (746 TS), part of the United States Air Force (USAF) 704th Test Group (704 TG), recognised there was a need to provide operational and

developmental test communities with a cost-effective, operationally realistic venue to facilitate navigation system testing and training objectives. Twenty years ago, the 746 TS started what is now known as Navigation Festival (NAVFEST) to fill that need.

NAVFEST provides low-cost, realistic, Global Positioning System (GPS) Electromagnetic Warfare (EW) scenarios to test GPS-based navigation and alternate navigation systems as well as train personnel in unique GPS-denied environments. The cost-sharing event enables 746 TS and 704 TG to provide a diverse testing and training opportunity for about 96% less than the cost of a standalone program.

Read more in *Inside GNSS* article. https://insidegnss.com/navfest-20-years-of-cost-effective-gps-navwar-testing/
2024-09-16

New Galileo Satellites Operational After Successful In-Orbit Testing

Three months after their launch from Cape Canaveral Florida by SpaceX, Galileo satellites 29 and 30 are fully operational at their target positions. The two new satellites are active and providing navigation signals to users, increasing the accuracy of the system and guaranteeing the availability and robustness of Galileo signals.

Both satellites have been deployed on the same orbital plane, one of the three that make up the Galileo constellation. Now two of the three Galileo orbital planes are fully populated, bringing the constellation one launch away from completion. The

next Galileo launch is planned in the coming weeks from the Kennedy Space Center in Florida on board a SpaceX Falcon 9.

Read more in *Inside GNSS* article. https://insidegnss.com/new-galileo-satellites-operational-after-successful-in-orbit-testing/
2024-09-09

Integrating connectivity and UAVs

Nokia hopes to leverage its communication technology expertise to make a significant impact in the market for uncrewed aerial vehicles (UAVs or 'drones'). Thomas Eder, head of Nokia's Embedded Wireless Solutions, is leading the introduction of Nokia Drone Networks along with industrial and mission-critical private 5G networks. In this interview, he discusses Nokia's strategic move into high-end UAV solutions for sectors like mining and oil & gas. Eder emphasizes Nokia's collaborations with geospatial industry leaders, such as YellowScan, to create integrated, turnkey solutions that push the boundaries of innovation.

Read more in *GIM International* article. https://www.gim-international.com/content/article/integrating-connectivity-and-uavs?utm_source=newsletter&utm_medium=email&utm_campaign=Newsletter+%7C+GIM+%7C+19-09-2024++&sid=46052
2024-09-18

China launches two more satellites for Beidou navigation system

China successfully launched two new satellites on Thursday morning as part of its Beidou Navigation Satellite System, according to the China Satellite Navigation Office.

"The satellites were carried by a Long March 3B rocket that lifted off at 9:14 am from the Xichang Satellite Launch Center in Southwest China's Sichuan province and were deployed into a medium-Earth orbit." This marks the 14th group of third-generation Beidou satellites operating in medium-Earth orbits and is the second batch launched into such an orbit since the Beidou global system was completed, the office confirmed in a news release.

"The two satellites will start formal operation after a period of in-orbit technical verification," it said, "noting that they are equipped with upgraded atomic clock system and new inter-satellite data link."

"In addition to positioning and navigation services, the pair will also demonstrate new technologies to be used on the next-generation Beidou system," according to the release.

Read more in *Space Daily* article.
https://www.spacedaily.com/reports/China_launches_two_more_satellites_for_Beidou_navigation_system_999.html
2024-09-20

Israel GPS 'spoofing' against missiles disrupts civilian life, aviation in Lebanon and Middle East

Booby-trapped pagers and walkie-talkies are not the only ways Israel has been hitting Hezbollah's communications.

In fact, one of Israel's other ploys, while less deadly, has been causing chaos for the broader Lebanese population, as well as confusion for people within its own borders.

Since the start of the Gaza war, the Israel Defense Forces (IDF) has been deploying a tactic known as GPS "spoofing", designed to fool enemy missiles and rockets that rely on the global positioning system technology to aim at their target.

And while it may have helped deflect some aerial attacks, it has also been disorienting for everyday people — making modern map technology on smart devices unavailable and disrupting important civil infrastructure, commercial aircraft and even dating and food delivery apps.

The situation has even led some Israelis to return to traditional paper maps, as an analogue solution to the digital disruption.

Read more in *article*…
https://www.abc.net.au/news/2024-09-22/israel-gps-spoofing-lebanon-beirut-hezbollah/104373018
2024-09-21

GNSS spoofing threatens airline safety, alarming pilots and aviation officials

The increasing prevalence of GNSS spoofing in commercial aviation poses significant safety concerns and highlights the need for robust alternative positioning, navigation and timing (A-PNT) sources. This form of electronic warfare, which uses fake signals to confuse aircraft navigation and safety systems, has become a growing issue for civilian flights worldwide.

Pilots told *The Wall Street Journal* that spoofing incidents have risen in recent months. According to analyses from SkAI Data Services and the Zurich

University of Applied Sciences, the number of affected flights per day increased from a few dozen in February to more than 1,100 in August 2024.

The issue of spoofing has expanded beyond active conflict zones near Ukraine and the Middle East, and now affects hundreds of civilian pilots daily on a global scale. The modern cockpit's heavy reliance on GPS technology means that falsified data can have far-reaching consequences, breaching multiple aircraft systems and causing disruptions that may last anywhere from a few minutes to an entire flight.

Read more in *GPS World* article…
https://www.gpsworld.com/gnss-spoofing-threatens-airline-safety-alarming-pilots-and-aviation-officials/?utm_source=Navigate%21+Weekly+News&utm_medium=Newsletter&utm_campaign=NCMCD240918002
2024-09-24

OSNMA: Necessary But Not Sufficient for GNSS Security

Given their low power and public structure, civilian GNSS signals are susceptible to any in-band interference and counterfeit signals, thus need to be protected. GNSS cryptographic protection involves encryption and/or authentication techniques to safeguard GNSS signals from being used by unauthorised users or manipulated by counterfeit transmitters. Galileo Open Service Navigation Message Authentication (OSNMA) is a prominent example of GNSS authentication.

In OSNMA, corresponding data is embedded within the Galileo I/NAV message transmitted over the E1-B open service signal. This process uses message authentication codes generated with a key that is broadcast with some delay. The key is part of a pre-generated, one-way chain whose root can be publicly verified and

is transmitted in reverse order of its generation. Enabling OSNMA as a security feature necessitates the essential cryptographic functions to validate the received secret keys, retrieve the authentication codes and verify the authenticity of the navigation data, which is not trivial to implement.

Read more in *Inside GNSS* article. https://insidegnss.com/osnma-necessary-but-not-sufficient-for-gnss-security/
2024-09-23

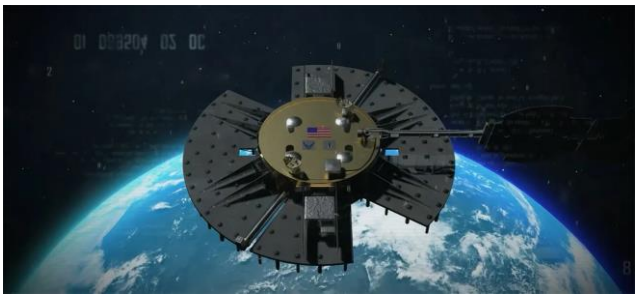
U.S. eyes geostationary orbit for next-gen GPS

An experimental U.S. military satellite designed to test new space-based navigation technologies has been waiting nearly 20 months for a ride to geostationary Earth orbit (GEO).

The Navigation Technology Satellite-3 (NTS-3), developed by the U.S. Air Force Research Laboratory, aims to test advanced technologies for future GPS and satellite navigation systems. Its launch, potentially before year's end, hinges on the certification of United Launch Alliance's Vulcan rocket.

NTS-3 is set to explore next-generation positioning, navigation, and timing (PNT) technologies that could help modernise the Global Positioning System. The mission is significant for the U.S. military, as it would provide a rare chance to test PNT capabilities from GEO — a domain where China's BeiDou system currently has the upper hand.

Read more in *the* article. https://spacenews.com/u-s-eyes-geostationary-orbit-for-next-gen-gps/
2024-09-23



Vulnerabilities in GPS smartphone technology could let hackers map home interiors

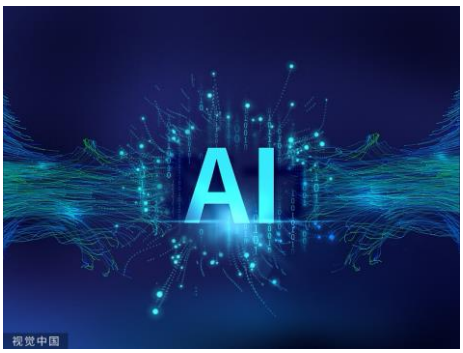
Vulnerabilities in modern smartphone technology could make it possible for criminal hackers to map the inside of your home using GPS data processed by AI algorithms.

In one experiment, researchers used AI to decipher whether a person was standing in a room, sitting or even waving at the phone with up to 97 percent accuracy. This was achieved without a single camera used to provide visual or audio context.

GPS data is well known for containing longitude and latitude data in order to pinpoint where in the globe you are.

However, this is not the only information the technology stores. Over forty other metrics are included in GPS tracking to improve accuracy, such as signal to noise ratio and Doppler shift, a term describing the movement of a receiver relative to transmission waves to track motion activity. These additional metrics can provide a detailed presentation of an environment inaccessible by visual devices.

Read more in article.
https://www.chinadaily.com.cn/a/202409/25/WS66f2f8c9a310f1265a1c49b3.html
2024-09-25

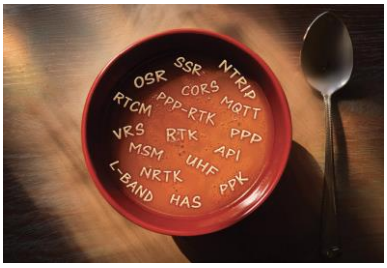


Demystifying GNSS Corrections

There’s a clear need for GNSS corrections, but the alphabet soup of service flavours, delivery methods and business agreements make choosing the right service seem overwhelming. We break it all down and take a look at how you can use GEODNET’s web3 Network of GNSS reference stations to manage your own GNSS corrections service.

With the rapid advance of autonomy and AI, precise spatial context is now crucial for many applications from urban navigation to agricultural automation. The need for GNSS corrections is growing, but the alphabet soup of service flavours, delivery methods and business agreements involved can be intimidating when it comes to selecting a service.

Read more in *Inside GNSS* article. https://insidegnss.com/demystifying-gnss-corrections/
2024-09-18



Dr. John Raquet Receives Kepler Award

The Institute of Navigation recognises Dr. John Raquet with prestigious Johannes Kepler Award at the ION GNSS+ 2024 Conference.

The Institute of Navigation’s (ION) Satellite Division awarded Dr. John Raquet its Johannes Kepler Award on September 20, 2024, during the ION GNSS+ 2024 conference in Baltimore, Maryland, for significant technical contributions to GPS/GNSS integrated navigation systems; sustained leadership in the Department

of Defense (DoD) and international community; and for the education of navigation professionals.

Read more in *Inside GNSS* article. https://insidegnss.com/dr-john-raquet-receives-kepler-award/
2024-09-24