DEPARTMENT OF ELECTRONIC SYSTEMS

ABOUT US

We strive to be internationally recognised as a leader in digital technologies – a department with coherent activities within research, education, development and industry cooperation.

Leading in digital technologies

We conduct world-class research in areas ranging from communication, antennas, control systems, AI, sound, cybersecurity and robotics. Our research deliver outstanding contributions to the world.

The department offers a broad range of educational programmes at both undergraduate and postgraduate levels as well as continued professional development.

Leading in digital technologies

We conduct world-class research in areas ranging from communication, antennas, control systems, AI, sound, cybersecurity and robotics. Our research deliver outstanding contributions to the world.

The department offers a broad range of educational programmes at both undergraduate and development.

620 Students

620 students in both BEng, BSc and MSc programmes.

200 Staff members

Approx. 200 employees, of which 40% are international.

90 PHD students

Approx. 90 enrolled PhD students in one of our two main PhD programmes - Electrical and Electronic Engineering and Wireless Communications.

Sections

Automation and Control

CONTACT: ASSOCIATE PROFESSOR JOHN-JOSEF LETH

Antennas, Propagation, Milimetre-Wave...

CONTACT: PROFESSOR GERT FRØLUND PEDERSEN

Artificial Intelligence and Sound

CONTACT: PROFESSOR JAN ØSTERGAARD

Communication, Media and Information Technologies

CONTACT: ASSOCIATE PROFESSOR REZA TADAYONI

Connectivity

CONTACT: PROFESSOR PETAR POPOVSKI

Wireless Communication Networks

CONTACT: PROFESSOR PREBEN MOGENSEN

Research Groups

AI FOR COMMUNICATION

The AI for communication group focuses on applied AI research as an enabler of wireless innovation by combining machine learning with domain expertise in communication

WCN

AI RF-SENSORS

The AI RF-Sensors group focuses on the development and application of artificial intelligence (AI) techniques. It gathers researchers with wide-ranging expertise in AI, radio systems, sensors and bio-imaging.

APMS

ACOUSTICS AND HEARING

In this group, we conduct empirical research in the domain of acoustics and hearing, where the engineering solutions include the use of acoustical measurements, signal processing, information theory, psychophysics and sound field control.

AIS

ADVANCED ROBOTICS & AI

In the group Advanced Robotics & AI, we do research in Autonomous robotics and artificial intelligence are transforming how we explore, work, and interact with the world. These technologies enable safer operations in hazardous environments, drive innovation in automation, and expand our capabilities in areas beyond human reach.

AC

ANTENNAS

In this group, we aim at all challenging applications where antennas or electromagnetics can be applied to gain advantages.

APMS

AUDIO ANALYSIS LAB

The Audio Analysis Lab conducts research in audio and acoustic signal processing for good health and well-being. Our research focuses on how signal processing can be used to solve problems of importance to the health and well-being of people in their daily lives.

AIS

CONNECTIVITY

In this group we tailor a communication system to the different coexisting applications, device capabilities and diverse requirements and modelthe real-time system behaviours along with the associated communication links.

CNT

CYBER SECURITY

In this group, we focus on prevention and detection of cyberattacks. We build virtual labs for training, traffic generation and malware studies.

CMI

DEPENDABLE WIRELESS COMMUNICATIONS

In this group, we focus on centralising the multiple experimental research activities related to 5G and other wireless communication technologies when applied in different industries – e.g. manufacturing, automotive, non-terrestrial, smart-cities, health-care, farming, etc.

WCN

DIGITAL TRANSFORMATION

In this group, we study digital transformation from a technological perspective and contributes to the use of digital technologies when it comes to cyber security, privacy and sustainability.

CMI

EDGE COMPUTING AND NETWORKING

The focus in our group is research, development and implementation of networking and edge/cloud computing solutions, primarily in the context of 5G and beyond 5G systems.

CMI

GREEN DIGITAL ENERGY SYSTEMS

In this research group, we focus on modelling, design and analysis of smart solutions. Using the technologies of IoT and electricity distribution grids, we strive to create breakthroughs in digital energy systems and strong impact on the real world.

WCN

GREEN LAB

In this group we focus on sustainable society infrastructure. Our research includes complex systems, distributed systems and hierarchical, decentralised and networked control.

AC

HUMANS AND TECHNOLOGY

In this group, we focus on the interplay of technology and humans – psychology, user experience, usability, psychophysics, behavior, perception, and cognition. To improve the user experience, we work with cognition and phycology to understand how humans communicate with technology – e.g. eye tracking.

AIS

LEARNING AND DECISIONS LAB

In this group, we strive to learn the machines and infrastructures, to work autonomously, work together and collaborate with people.
The lab works towards new artificial intelligence methods to help our infrastructures and production in being more effective and energy-efficient.

AC

Read more about Learning

MACHINE LEARNING

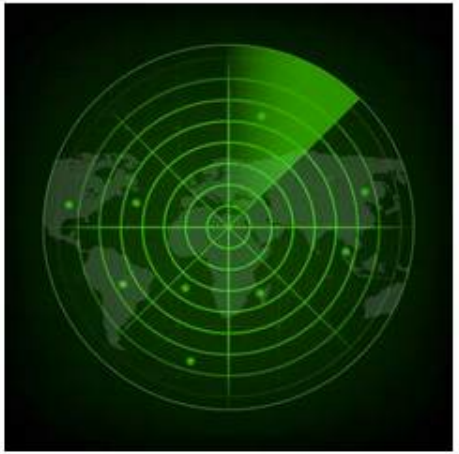
Using AI and machine learning, the group for example develops learning algorithms for hearing assistive devices. Through developing state-of-the-art machine learning algorithms, we make a difference in people's lives.

AIS

NONLINEAR AND OPTIMAL CONTROL LAB

The lab is centered around fundamental aspects of advanced control theory and aim to support different industries with developing and applying advanced nonlinear and optimal control methods to elevate technological solutions.

AC



RADIO SENSING & POSITIONING

Radio Sensing & Positioning, Aalborg University conducts research in Sensing and positioning, which are at the core of applications like RADAR, GNSS, cooperative localization and is today also integrated in communication systems.

WCN

WIRELESS PROPAGATION AND OVER THE AIR TESTING

We conduct research on radio channels with focus on solving real-world problems. We aim for experimental and theoretical breakthroughs within testing of advanced antenna systems.

APMS

uddannelse

Bachelor (3 år) → *og hvis man vil* → master (+2år) → *hvis man kan/få plads* → PhD (+3år)

Bachelor of Science (B.Sc.) Master of Science (M.Sc.)

Diplom Ingeniør (3½år)

Der eksisterer mulighed for, at efter 1. år på Diplom er det muligt at skifte til Bachelor

Man har IKKE krav på det – afh af om der bla er plads på bachelor studiet osv

M

Semester descriptions

- 1st Semester: Machine Intelligence +
- 2nd Semester: Systems of Systems +
- 3rd Semester: Five different options +
- 4th Semester: Master's Thesis +

Traineeship

In the 3rd semester of the master's programme in Electronic Systems, you have the opportunity to go abroad or spend your semester in a company.

Master II – ens typiske værktøjskasse

- New electronic hardware, such as antennas, filters, and amplifiers for improved communication in small terminals and embedded systems, with applications in new areas such as healthcare, Internet of Things, autonomous driving, etc.
- Intelligent electronics and systems whose overall performance and energy efficiency are improved through machine learning.
- Ultra-reliable communication for smart manufacturing, autonomous vehicles, and unmanned aerial vehicles (drones).
- Process control for embedded systems (with machine intelligence), from electronic hardware to software.
- Systems with Artificial Intelligence for improved products, services, and living conditions.

BACHELOR

ELEKTRONIK OG SYSTEMDESIGN

Elektronik og Systemdesign er en ingeniøruddannelse for dig, der drømmer om at designe og konstruere hardware og software til avancerede elektroniske systemer i fx selvkørende biler, rumfartsteknologi, medicinsk udstyr, audio-systemer og droner. Lær at bygge og teste moderne elektroniske systemer.

DIPLOMINGENIØR

ELEKTRONIK, DIPLOMINGENIØR

På diplomingeniøruddannelsen i Elektronik lærer du at udvikle elektroniske produkter som fx trådløse head-sets, droner eller batteristyring til eldrevne køretøjer. Lær om analog og digital elektronik, programmering og signalbehandling, og prøv det hele af i dit praktikforløb i en virksomhed.

spørgsmål ? – lidt luft

SPACE

FORSKNING

Aalborg Universitet er en del af en lang række spændende forskningsprojekter med relation til rummet indenfor både rumteknologi, satellitter og brugen af data - både upstream og downstream.

Forskning ›

UDDANNELSE

I AAU Student Space har studerende ved Aalborg Universitet i mere end 20 år udviklet og opsendt mini-satellitter, kaldet cubesats. Indtil videre er fem satellitter blevet sendt i kredsløb om Jorden.

Uddannelse ›

INNOVATION

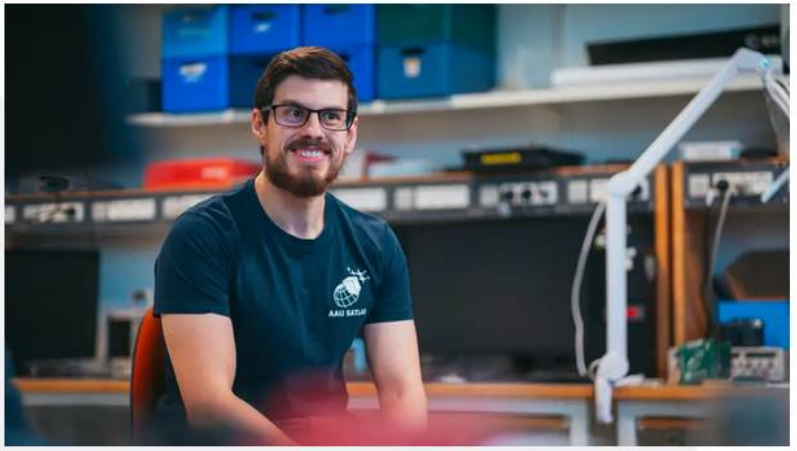
Har du en idé med et kommercielt potentiale og en relation til rummet? Så kan du få sparring gennem inkubationsprogrammet ESA BIC Danmark, som er en del af AAU Space.

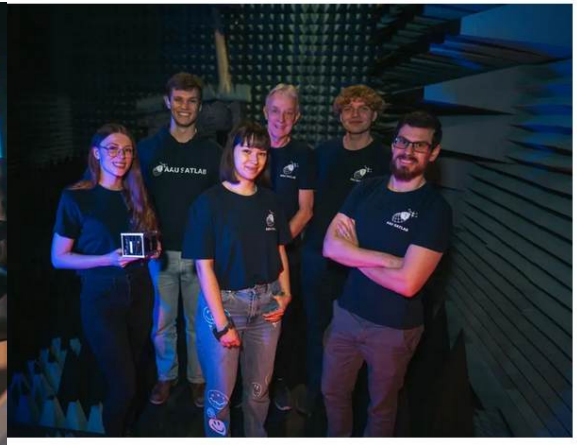
Innovation ›

https://www.space.aau.dk/

ISRAEL LEYVA-MAYORGA: THE SATELLITE RESEARCHER WITH SOCIETY IN MIND

: 18.09.2025





Satellites as Lifelines

- **Sensing**, so satellites can “feel” the weather and detect signs of, for example, floods or earthquakes.
- **Edge computing**, which enables satellites to process data directly in space without relying on Earth-based data centres.
- **Artificial intelligence (AI)**, which helps satellites analyse complex patterns and adapt quickly, so they can deliver stable and efficient communication—even under extreme conditions.

AAU SATLAB

Home About AAUSAT6 News History Join us Contact

It is all about Unlocking Space

Since 2001, we, students at AAU, have constructed, launched, and operated five CubeSats with great success.

With number six – AAUSAT6 well under the way.

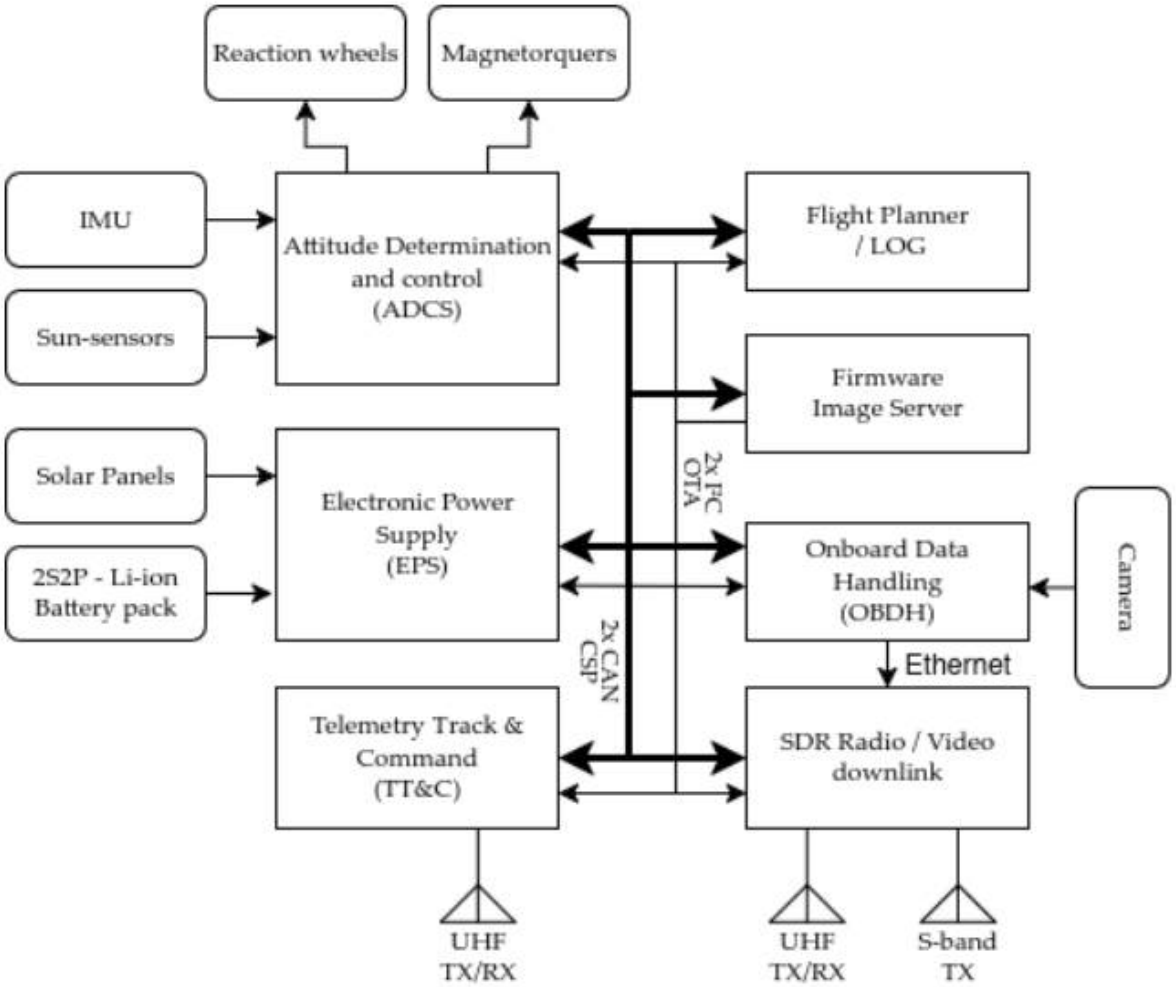
> *To infinity and beyond*
> *– Buzz Lightyear*

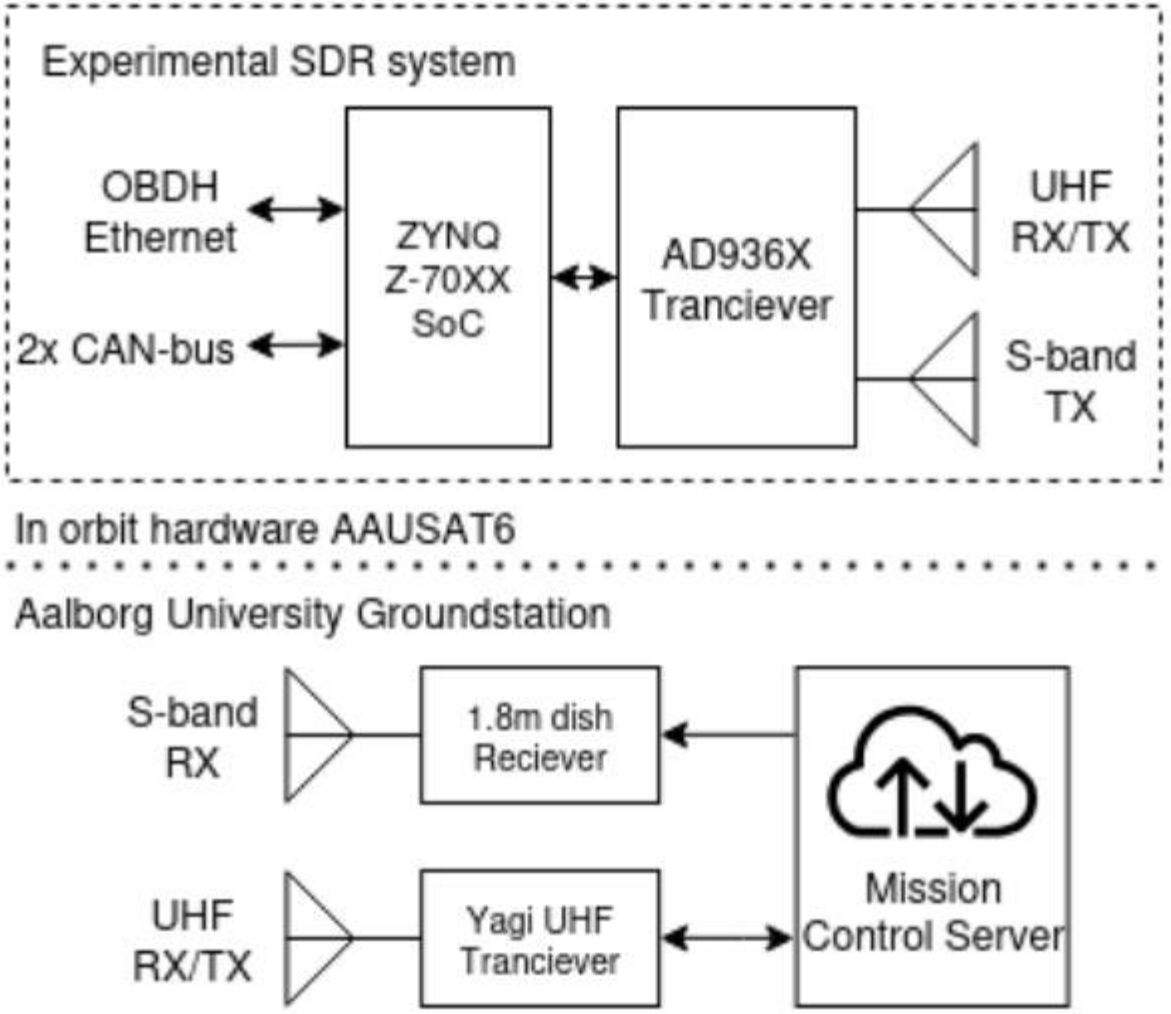
AAUSAT 6: An Experimental Platform in Space

AAUSAT6, is our sixth student-developed satellite from Aalborg University. As with our previous missions, the primary purpose is education, where we want to elevate students and our members to their highest potential.

To achieve this goal, the satellite bus itself is the payload. It contains multiple software-defined elements that can be reconfigured and updated over the air. This includes critical elements and non-critical systems such as the Camera and Software Defined Radio (SDR). These systems will be able to serve the next generation of students and researchers at AAU, enabling in-orbit experimentation.

- 2U CubeSat spanning 20×10×10cm
- A complete redesign with knowledge from former missions
- Video streaming enabled by DVB-S2 & improved pointing accuracy
- Firmware Image Server enabling over-the-air updates
- An In-orbit experimental platform for UHF & S-band radio


Reaction wheels
Magnetorquers
IMU
Sun-sensors
Attitude Determination and control (ADCS)
Flight Planner / LOG
Firmware Image Server
2x I²C OTA
Solar Panels
2S2P - Li-ion Battery pack
Electronic Power Supply (EPS)
Onboard Data Handling (OBDH)
Camera
Ethernet
2x CAN CSP
Telemetry Track & Command (TT&C)
SDR Radio / Video downlink
UHF TX/RX
UHF TX/RX
S-band TX


Experimental SDR system
OBDH
Ethernet
2x CAN-bus
ZYNQ
Z-70XX
SoC
AD936X
Tranciever
UHF
RX/TX
S-band
TX
In orbit hardware AAUSAT6
Aalborg University Groundstation
S-band
RX
1.8m dish
Reciever
UHF
RX/TX
Yagi UHF
Tranciever
Mission
Control Server

launch – when we are ready :-)

- 2027 ?! I hope

Camera in space