

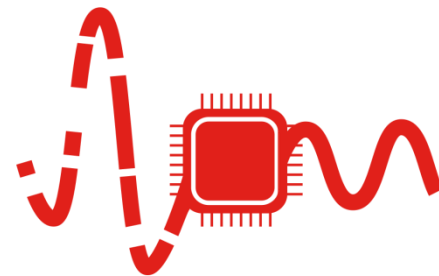
Company presentation

RECTANGLE
SPOT-ON DEVELOPMENTS

RECTANGLE is a hi-tech SME offering products and development services in the area of measurement instruments and precise Guidance Navigation and Control. The company delivers customized software and hardware solutions tailored to the specific application requirements.



Sensor
fusion



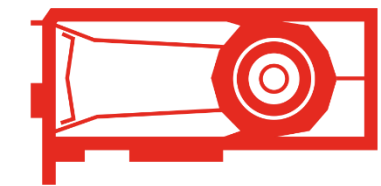
Receiver
robustness



Time
reference



Guidance
and control



Devices and
systems

Sensor fusion



Targeted threads

Metrology, sensing technology and methods used for most efficient integrated navigation systems

GNSS positioning, velocity and time

inertial sensors

bearing and ranging sensors: RADAR, LiDAR

pressure sensors

magnetic sensors

optical camera, thermo-camera, star-tracking camera

sound-based ranging and positioning

Applications examples

Solutions to most demanding navigation applications, where robustness and reliability are required

increasing robustness of a GNSS receiver

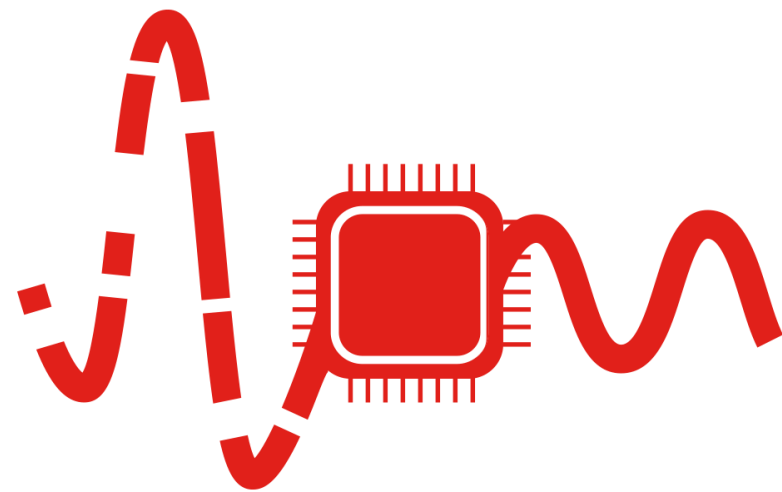
through integration with inertial measurements

high-reliable navigation system under little or no support of the GNSS positioning

indoor navigation

pedestrian navigation

Receiver robustness



Targeted threads

Most identified, multiple sources of an error in the telecommunication and navigation solutions, to which a radio systems are vulnerable

multipath effects

radio interferences

spoofing

meaconing

Applications examples

Solutions providing greater stability and continuity of the telecommunication and navigation services. Maximize coverage of the system and precise navigation in automatized environments

interference detection and mitigation algorithms

multi-band multi-constellation solution

effective RF-filtering based on array antenna beam-forming

authentication

Time reference



Time distribution, synchronization

Knowledge and realization of techniques providing single nanosecond synchronisation of the telecommunication systems devices

precise GNSS time reference modules

precise time distribution protocols used over fibre

optic networks

Applications examples

Solutions and systems to which precise synchronization is vital, e.g. applications increasing precision of navigation

network nodes absolute time synchronization

time division telecommunication systems

synchronization of remote clocks

time synchronization support in the block-chain technology

precise dead-reckoning systems realized on ultra-precise devices synchronization

Guidance and control



Guidance and control systems for the autonomous vehicles

Methods and algorithms supporting control of flying vehicles; guidance for autonomous driving in unknown environment

on-board computer and measurements systems

collision avoidance algorithms

mission planning & management software

attitude control algorithms

Applications examples

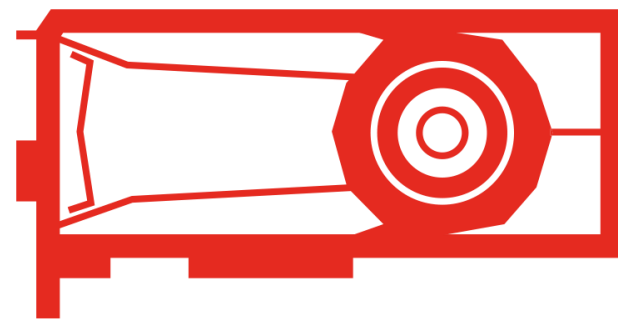
Opportunity to use in any flying, driving or swimming platform for an autonomous mission with quick response to environment

aircraft steering and flight stabilization assistance

reconnaissance, inspections, geodesy and transportation

safety control and landing systems

Devices and systems



Devices categories

Low-cost, mid-range or high-performance devices built according to own designs; typical priorities are low-energy consumption, flexible and powerful FPGA designs

FPGA based GNSS Software Defined Receiver

small, portable, battery-powered units

laboratory reference boards (standalone, PCIe)

industrial, waterproof integrated devices

Applications examples

Standalone devices or complex, integrated systems combined with an optimized telecommunication system; hardware, complementary component combined in a system with GUI, navigation and control algorithms

automotive navigation boards for vehicles

compact, battery powered navigation devices

certified navigation or time reference systems for indoor or outdoor applications

laboratory equipment for RF sensor fusion and navigation applications

navigation systems test-beds



A Robust Interference DETection Algorithm for the hybrid GNSS/INS receivers – RIDETA



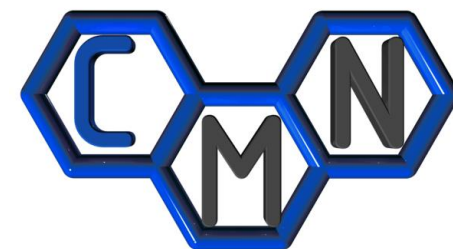
Hybrid UAV-UGV for Efficient Relocation of Vessels (HUUVER)



A robust anti-spoofing and anti-interference GNSS receiver front-end



System for monitoring, detection and location of interferences in radio frequency bands dedicated to navigation and telecommunication systems



Navigation, Guidance & Control Solution for UAV/UGV platforms

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GROUND CONTROL STATION



Portable ruggedized computer solution allowing handling all tasks related to UAV/UGV operations

Product specification

Dimensions: 82.8 x 46.7 x 28 cm

Environmental protection: IP67

Power supply: 24V DC

Two touch displays (19" and 11")

Extendable with AR goggles

Battery set operation time: up to 5h

External power source connector

Operating temperature: -35°C to +50°C

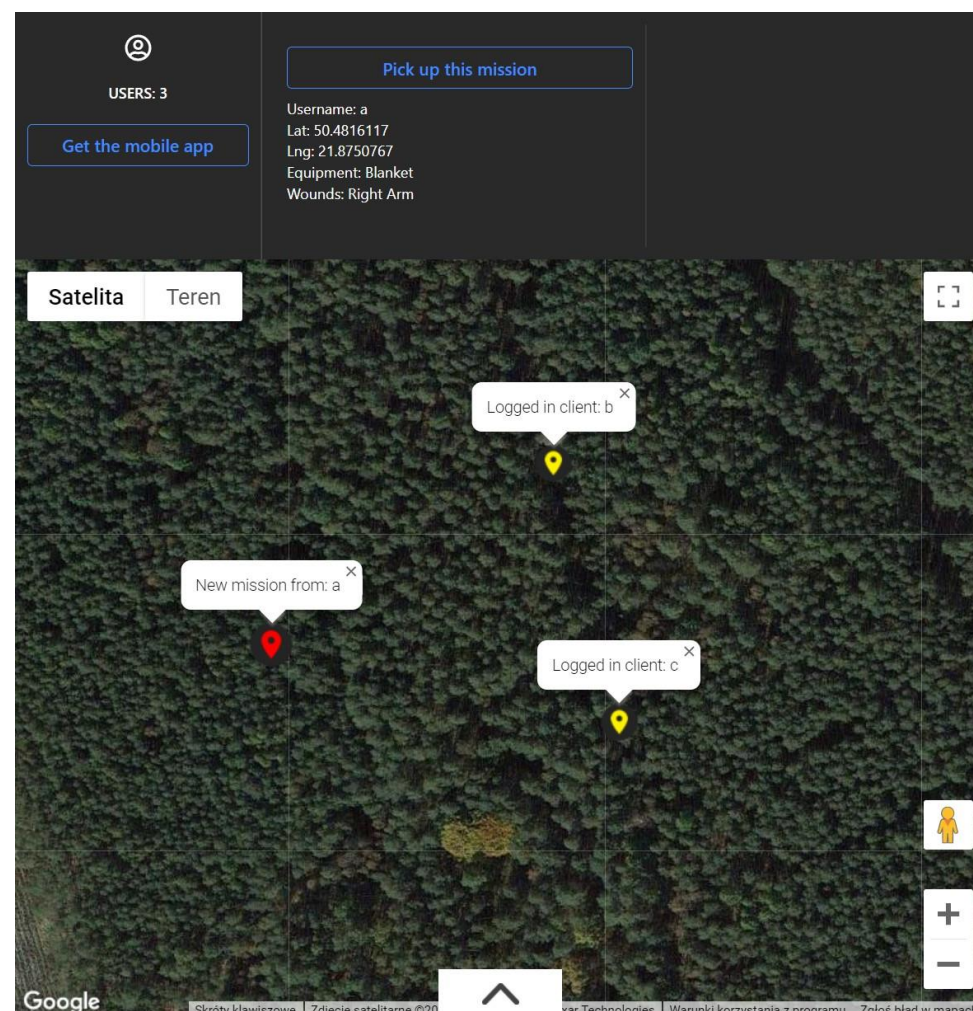


MISSION PLANNING & MANAGEMENT SOFTWARE



Software solutions providing automated UAV/UGV mission planning & fleet management

Functionalities & features - mission planning & execution



Integration with any unmanned system

Mission planning module - mission waypoints, flight profile, maneuvers, actions, mission time and power estimation

Flight parameters visualisation - attitude, altitude, ground speed, airspeed, vertical velocity, heading

Drive parameters visualisation - heading, obstacle distance

Real-time display of telemetry data - power consumption, engines rotation speed, temperature, system health status

Navigation data visualisation - geographical localisation, heading, mission waypoints

Video stream visualization from on-board camera

Emergency procedures editor

Multiple screen support & AR support

MISSION PLANNING & MANAGEMENT SOFTWARE



Software solutions providing automated UAV/UGV mission planning & fleet management

Functionalities & features - mission equipment
and payload management

Multi-payload system control

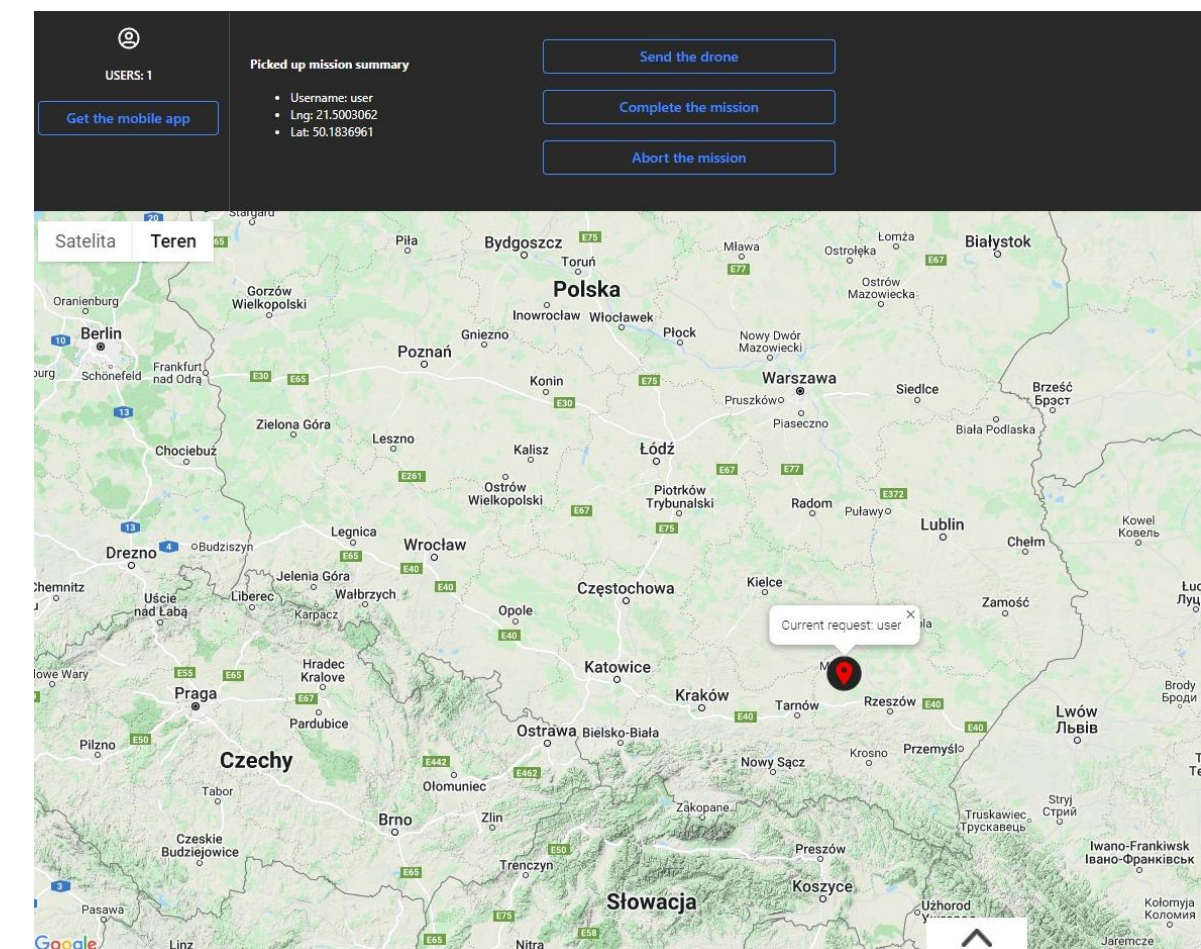
Gimbal & camera support

Video streaming or picture support

Geotagging

Displaying payload data on map

Navigation camera support





Autopilot - control solutions for UAV and other unmanned vessels

Functionalities & features

Attitude control

Altitude, airspeed and heading control

Flight along a programmed trajectory

Automated take-off and landing procedures

Autotaxing

Automatic maneuvering

High reliability (DO-178 C)

Implemented failsafe functions

Impact and vibration resistant

Thank you

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