

Winner of the EGNSS Innovative Ideas Contest organized by the UKRAINE project
National Technical University of Ukraine "Kyiv Polytechnic Institute"

Compact and energy-efficient GPS/GLONASS satellite navigation system signals receiver for vehicles monitoring systems



Background

Compact and energy-efficient GNSS receiver, designed in the framework of UKRAINE project, allows to improve navigation equipment performance and reduces the probability of position fix failure of navigation equipment.

Proposed innovative GNSS receiver:

- Supports both satellite navigation systems GPS and GLONASS
- Provides high positioning accuracy due to support of EGNOS
- Provides reduced time-to-first fix
- Has low power consumption



European
Global Navigation
Satellite Systems
Agency

H O R I Z  N 2 0 2 0

Problems of satellite navigation systems in Ukraine

Energy consumption

Foreign production

The ratio of cost / accuracy

Reliability in difficult conditions

Decision

To improve the efficiency and the reliability of determining the coordinates of the object by GNSS receiver, especially in urban and mountain areas.

The solving of the problems

Designed receiver satisfy the requirements, such as :

Using both satellite navigation systems (GPS + GLONASS)

High positioning accuracy by using EGNOS

Reduced time-to-first fix

Using advanced chipsets

Target audience

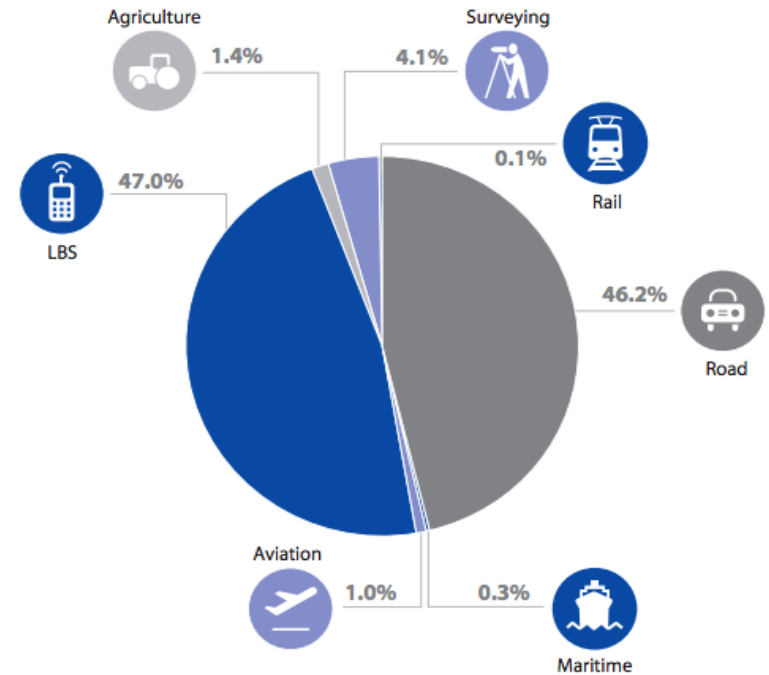
Transport logistics companies

Agriculture

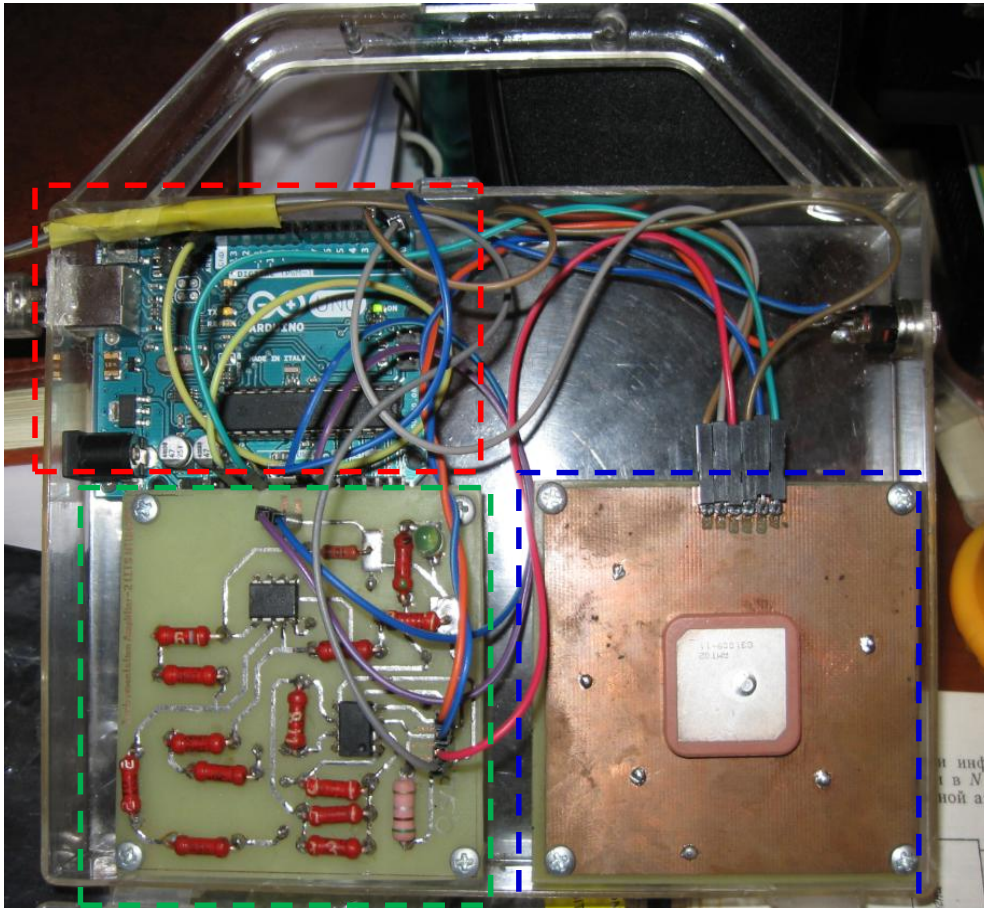
Aviation

UAVs

Cumulative core revenue 2012-2022



Product



Prototype of GNSS receiver
blue line

Controller Arduino Uno
red line

Power consumption meter
green line

Product benefits

Lower cost of the receiver – 5-10 EUR

Lower power consumption – 25...30 mA

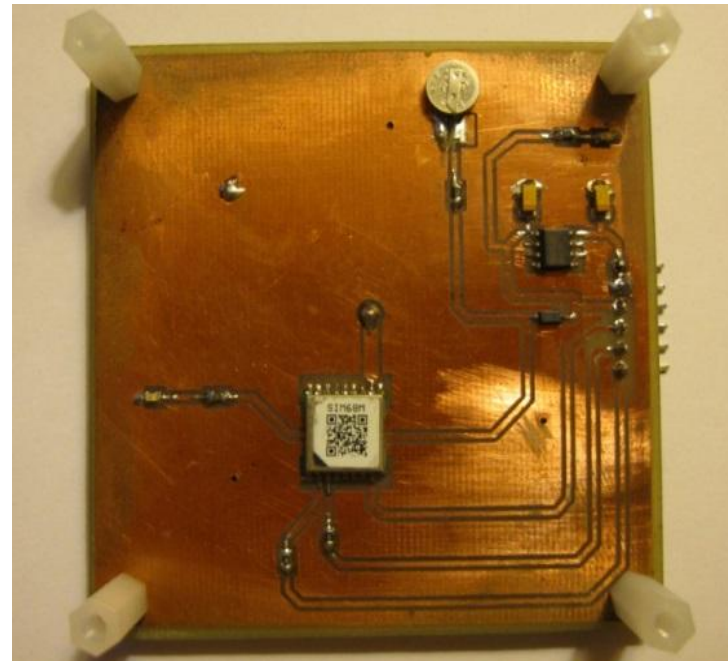
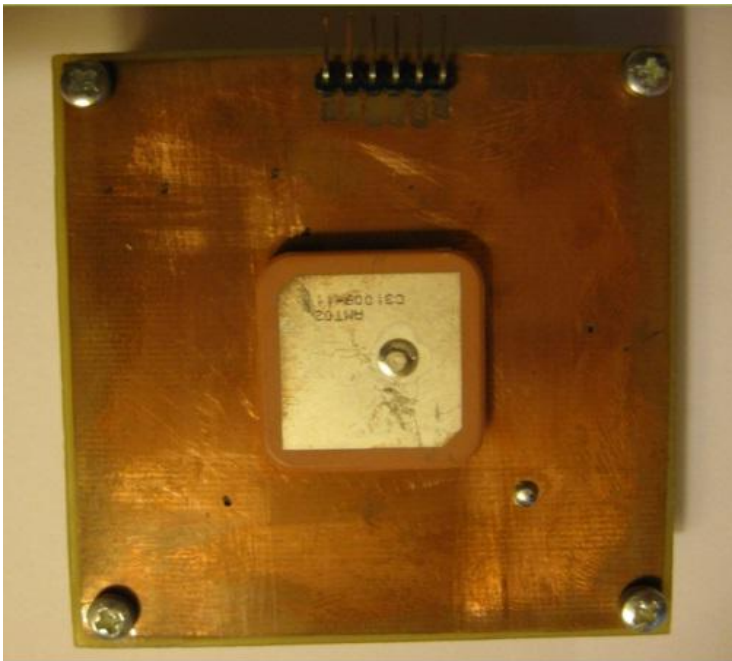
Position accuracy – 0.5...12 m

Reliability of position fix –
due to using GPS+GLONASS

The benefits of the product were confirmed by measurements of basic parameters

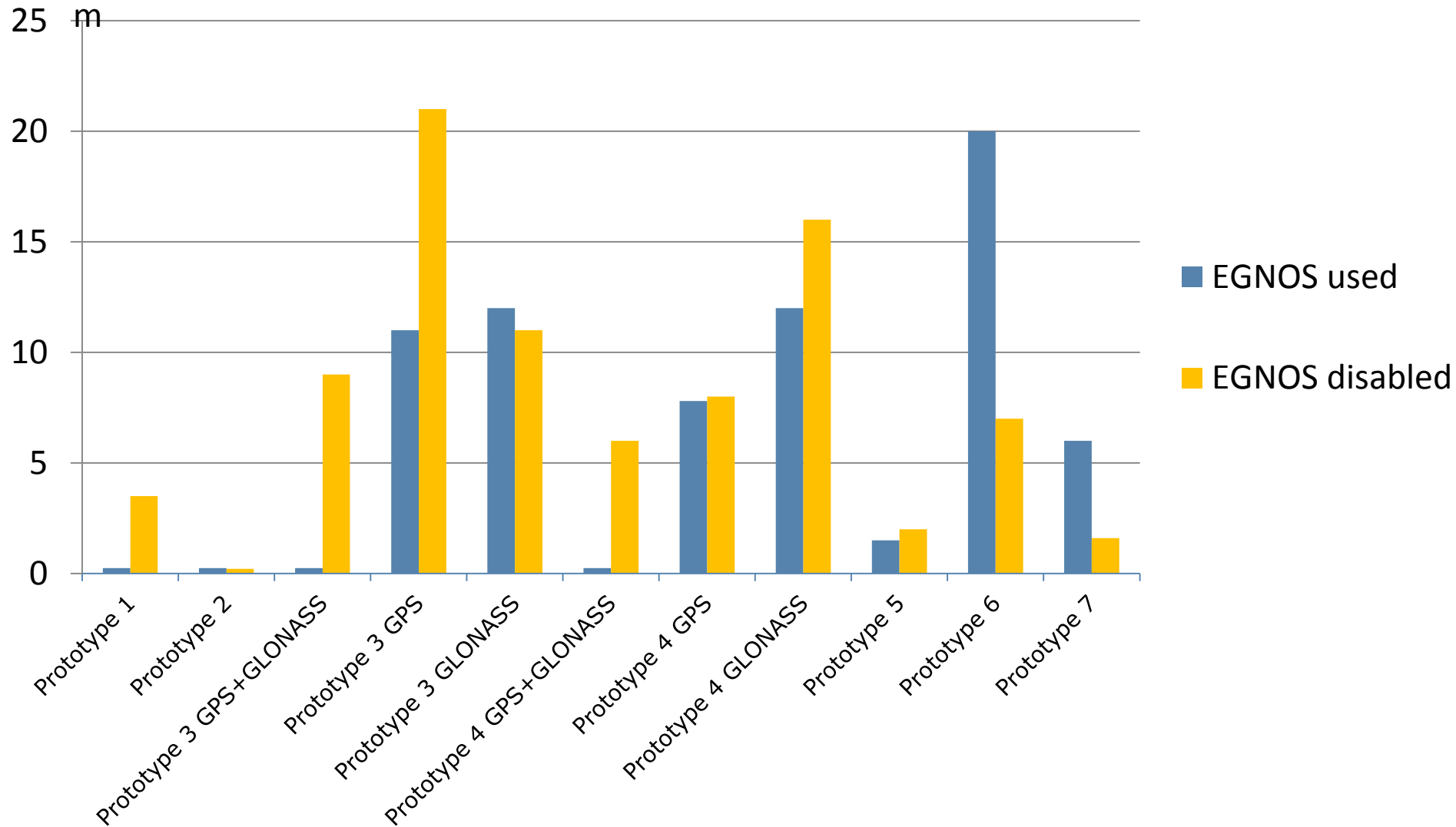
Progress

- Completed development of pre-series batch (10 units)
- Measured basic parameters

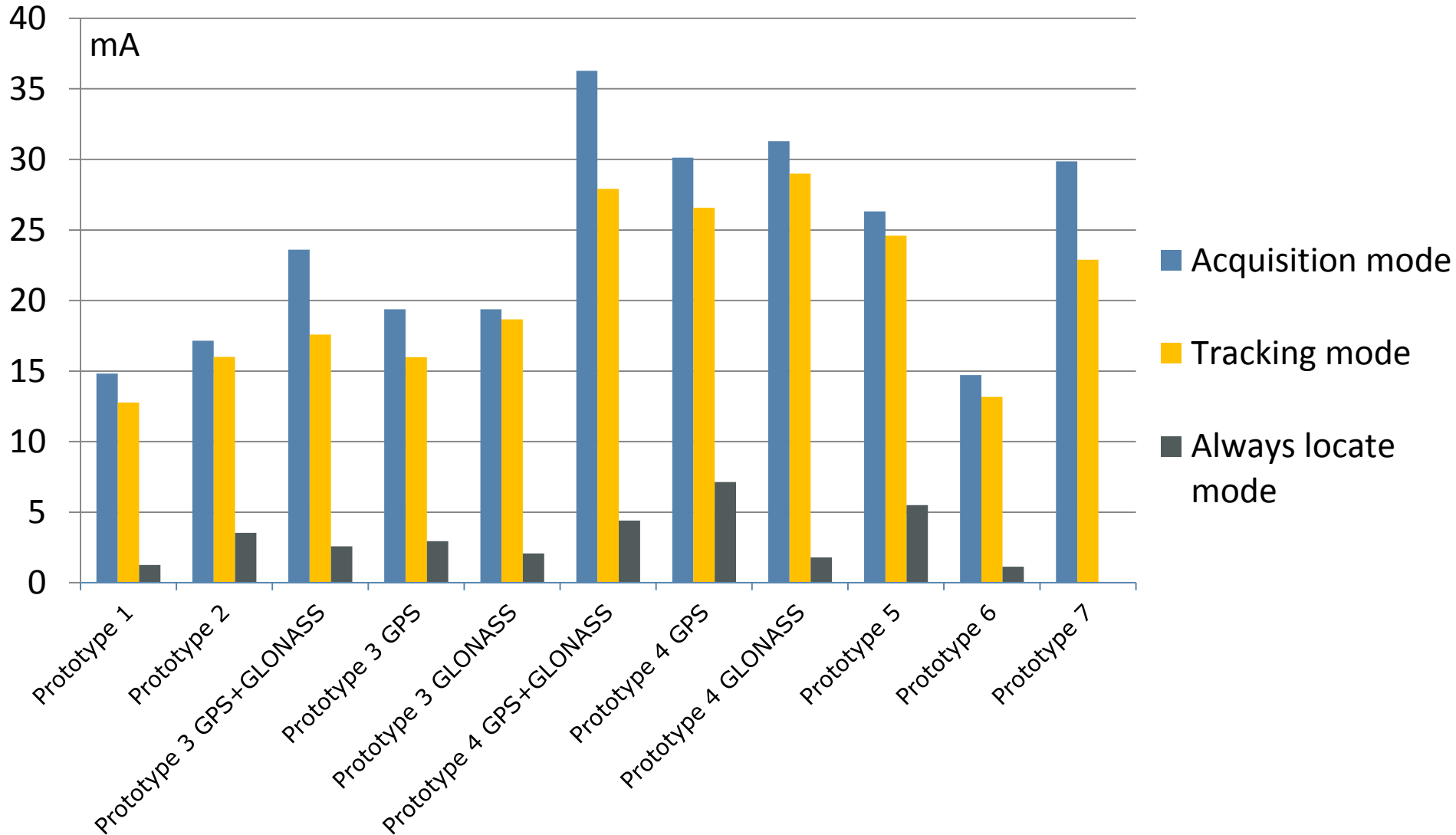


The receivers are based on SIMCom SIM68M, SIMCom SIM68V , SIMCom SIM28M, LINX RXM-GPS-RM , TranSystem EB-500, LOCOSYS MC-1513 GNSS modules.

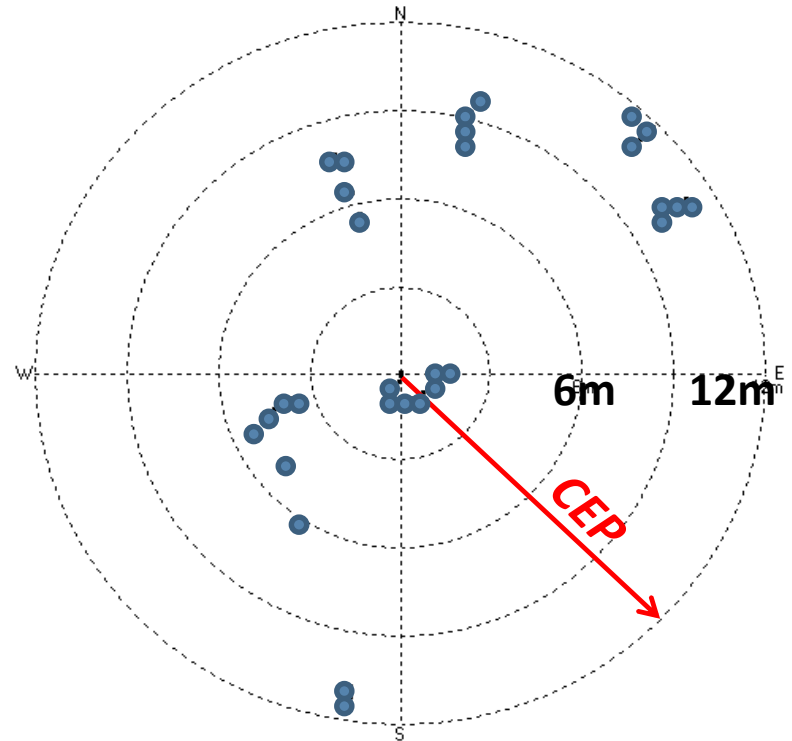
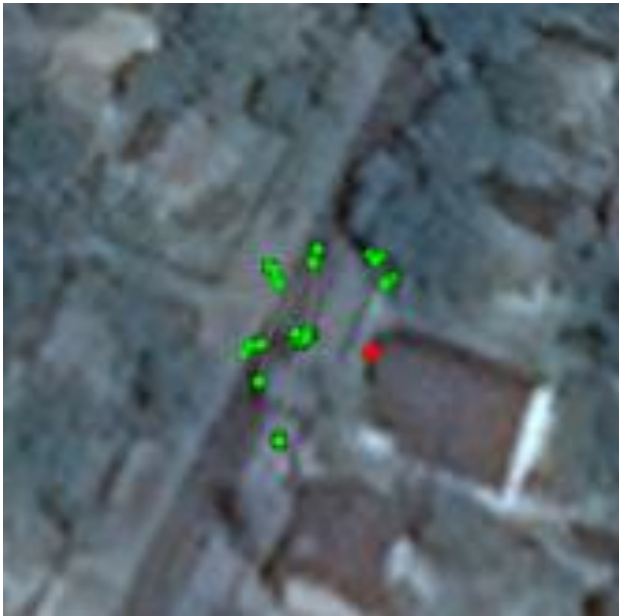
The results of Circular Error Probability (CEP) measurement for GNSS modules



The results of current consumption measure of GNSS modules in different modes



Deviation Map of designed GNSS receiver



Red dot - the real location of GNSS receiver

The green dot - locations determined by the GNSS receiver mode (3D)

Competition



EUROPEAN
SATELLITE NAVIGATION
COMPETITION 2016

The competition is now in the evaluation phase.



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EUROPEAN
SATELLITE NAVIGATION
COMPETITION 2016

Dovhan, Bohdan

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ID	Title	Region	Special Prize	Competition	Status	Submission Status	Created On	Changed On
160735	Compact and energy-efficient GPS/GLONASS satellite navigation system signals receiver for vehicles monitoring systems	Baden-Württemberg / Germany	GSA: The most innovative application idea for Galileo Initial Services	European Satellite Navigation Competition 2016	Completed Idea	100%	24/05/2016	07/06/2016

Support required

Technical support

Finance support

Incubation support

Access to testing facilities

Project team

Gleb Avdeyenko,
Senior Lecturer
of the NTUU"KPI"



Bohdan Dovhan,
4th year student of the
NTUU"KPI"

