

SIGMISDIGG

Ensuring GNSS Reception for Military and Safety/Security Critical Services in Mountainous Terrain

Final Presentation

Presenter:

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IGASPIN GmbH

Privately owned company (SME)

- Founded in 2015, operational since 05/2016
- Legal form: GmbH
- Located in GRAZ, Austria



**Smart Business Center,
IGASPIN location**

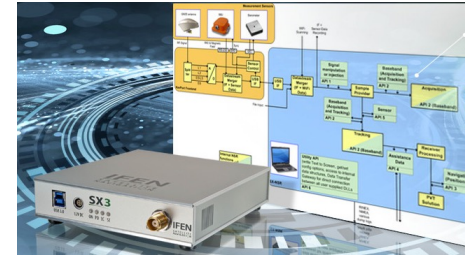
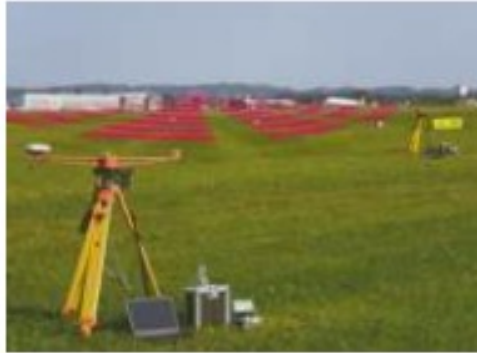


Graz, Austria

IGASPIN GmbH

Focused on

- ✓ Satellite navigation
- ✓ GNSS interference detection, mitigation, and localization
- ✓ GNSS software receiver (with exclusive right to develop software receiver).
- ✓ Artificial intelligence in GNSS realm.



Problem definitions

Positioning in harsh environments such as urban canyons or mountainous regions is still a challenging task in the realm of GNSS.



Objective

The aim of the SIGMISDIGG project is to evaluate possible approaches to have better positioning in harsh environments focusing on mountainous areas such as Alpine regions in Austria.



GNSS alternatives



Repeater

a device that receives a signal and retransmits it.



Tuti

IGASPIN's GNSS Signal Manipulator and Repeater.



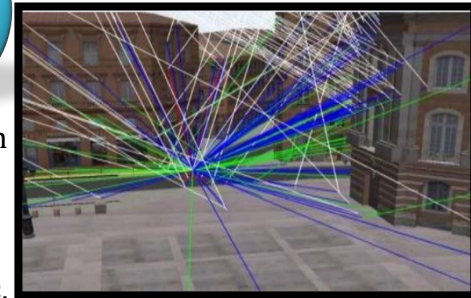
Pseudolite

a generator that transmits GNSS signals.



Reflectometry

a method to gain information by measuring and analyzing and reflected signals.



SWOT

	Strength	Weakness	Opportunity	Threat
Repeater	<ul style="list-style-type: none"> • Very simple. • No receiver modification. • Very low cost. • No regulatory problem. • No near-far problem. • No synchronization requirement. 	<ul style="list-style-type: none"> • The coverage is <50m. • Low accuracy. • Output=repeater position. • Multipath possibility. 	<ul style="list-style-type: none"> • Small coverage area with low accuracy requirement. 	<ul style="list-style-type: none"> • No possibility for further accuracy improvement. • Problem in tracking and positioning in transition between two environments.
Pseudolite	<ul style="list-style-type: none"> • Very good accuracy (Carrier-phase positioning capability). 	<ul style="list-style-type: none"> • Receiver modification. • Super high cost. • Regulatory problem. • Multipath possibility. • Near-far problem. • Difficult system maintenance. 	<ul style="list-style-type: none"> • Large area of coverage. 	<ul style="list-style-type: none"> • Small target areas and super high cost. • Target areas with very poor accessibility to the sky.
Reflectometry	<ul style="list-style-type: none"> • Fast and simple algorithm. • Low cost. • No regulatory problem. • No synchronization requirement. 	<ul style="list-style-type: none"> • Positioning depends on enough number of GNSS observations. • Receiver modification. 	<ul style="list-style-type: none"> • Large area of coverage with enough number of observations with high probability of multipath and NLOS receptions. • Stable tracking and positioning in transition between two environments. 	<ul style="list-style-type: none"> • No position when the number of observations is low.
Tuti	<ul style="list-style-type: none"> • Very good accuracy (Carrier-phase positioning capability). • No requirement to feed the information of repeaters to the receiver. • No receiver modification. • Low cost. • No regulatory problem. • Low multipath possibility. • No near-far problem. • No synchronization requirement. 	<ul style="list-style-type: none"> • Accuracy dependency on the number of transmitters. 	<ul style="list-style-type: none"> • Stable tracking and positioning in transition between two environments. 	<ul style="list-style-type: none"> • Synchronization requirement for very large coverage. • Dependency on the directional antenna performance in precise positioning.

Thank you!

Das Projekt wurde gefördert im Rahmen des österr. Verteidigungsforschungsprogramms FORTE des BMF.

 Bundesministerium
Finanzen



 **FFG**
Forschung wirkt.