Blue Dot Solutions

The company was founded in 2014 by graduates of Polish and foreign universities. The main goals of the company:

- Development of applications based on Earth observation (EO) data, including SAR;
- Development of applications based on satellite positioning (GNSS/GPS);
- Analyzes of the Polish and European space sector (market, opportunities, limitations, contact with stakeholders).

Active entity in Europe: ESA, H2020, commercial orders. Participation in European projects also as a leader/coordinator.

So far, no defensive or dual-use solutions have been developed.

The most famous service: the Space3ac accelerator

- 2016 - 2022: >150 technology startups supported, >PLN 40 M in grants awarded;
- The Space3ac accelerator is the result of the POSITION project (2015-2016), the first project in H2020 with a Polish coordinator.
Krzysztof Kanawka, PhD DIC
CEO, co-founder
ESA project management and H2020, consulting
Participation, including management
>PLN 15 M in ongoing projects and contracts, + definition of new projects, products and contacts
Technical and economic analyses
Experience from DE, UK, NL and FR

Maciej Mickiewicz
MSc, COO, co-founder
Specialization: transport
Extensive contacts with large Polish companies
Supervision > PLN 5 M in projects and orders
Technical and economic analyses

M. Korybut, M.A
Contract specialist.
Supervision > PLN 30 M in 150 agreements between the company and startups (within Space3ac)
Technical and economic analyses
Experience from FR and CA

Adam Piech
CTO, co-founder
Python, GNSS and EO specialist
Definition of new projects, products and contacts
Science publications
Space3ac acceleration program

- Program started in 2016. 11 editions completed;
- 12th edition starting in early 2024;
- 6 months long accelerator program;
- Startups are to solve challenges from the industry;
- 150 startups supported;
- 9 M Euro in grants allocated (equity-free);
- Access to investors, Demo Days;
- Space & non-space tech startups.
GROUND EYE

- IoT for airport ground operations;
- Testing phase since 2019;
- GNSS + LTE-M technologies;
- Own visualization interface with 2D or 2.5D graphics;
- Goal: better management of operations at the airport, reduction of paper work (both digital and paper).
FLAMINGO-IoT

- Result of a H2020 project with major European entities;
- GNSS “raw measurements” with own IoT device, onboard and cloud computing;
- Precision better than 50 cm;
- Focus on mobility in urban areas;
- Tests on buses and trams;
- Possible support to future automated and autonomous mobility.
2023 - rising GNSS interference

**Problem:** A growing number of interferences and jamming (accidental and intentional) of the GNSS signal, which may affect the safety of vehicle movement, the risk of damage, destruction or even interception of the vehicle by the adversary. Risk of denial of service for the location. Risk for critical infrastructure (sea port, airport, roads etc.)

GNSS jamming equipment is easy to acquire.
Report a GPS Anomaly

Point of contact email *

Point of contact phone *

Flight number *

*A/N/A if not applicable

Aircraft registration number (if available)

Aircraft type *

e.g. "0738", "E175", or "A319"

The Anomaly

Zulu (UTC) date *

mm / dd / yyyy

Zulu (UTC) time *

---:--

Three letter airport code *

e.g. "PHL", "N/A" if not applicable

Runway number *

e.g. "22L", "N/A" if not applicable

Location *

---
In MENA States, the number of GNSS/GPS interference reports shows a surge after 2019-05 and reduced significantly after 2020-04 (COVID-19 Pandemic).

In the highest peak (2019-06), 5.5 out of 100 flights reported GNSS/GPS interference over MENA States to GADM.
Two major clusters were observed:

- **Eastern Turkish airspace to Iraq, Iran, Armenia** (extended to border between Armenia and Azerbaijan)
- **Southern Cypriot airspace to Egypt, Lebanon and Israel** (extended to a corridor between Israel and Jordan)

Notably, these clusters locate around the Syrian airspace, where there is no regular civil operation.
# Number of Received Reports in Other Regions

<table>
<thead>
<tr>
<th>By States</th>
<th>Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>6</td>
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<tr>
<td>Russia</td>
<td>5</td>
</tr>
<tr>
<td>China</td>
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</tr>
<tr>
<td>United Kingdom</td>
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<td>Greece</td>
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<tr>
<td>Indonesia</td>
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<tr>
<td>Hungary</td>
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<td>France</td>
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<td>Slovakia</td>
<td>1</td>
</tr>
<tr>
<td>Mexico</td>
<td>1</td>
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<tr>
<td>Portugal</td>
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<td>Pakistan</td>
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<td><strong>Total</strong></td>
<td><strong>26</strong></td>
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<table>
<thead>
<tr>
<th>By FIR</th>
<th>Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles (KZLA)</td>
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</tr>
<tr>
<td>Moscow (UUWV)</td>
<td>2</td>
</tr>
<tr>
<td>Athens (LGGG)</td>
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<tr>
<td>London EGTT</td>
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<tr>
<td>Beijing (ZBPE)</td>
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<td>Jakarta (WIIF)</td>
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<tr>
<td>Rostov-Na-Donu (URRV)</td>
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<tr>
<td>New York (KZNY)</td>
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<td>San Juan (TJZS)</td>
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<td>Mexico (MMFR)</td>
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<td>Bratislava (LZBB)</td>
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<tr>
<td>Paint Petersburg (ULLL)</td>
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</tr>
</tbody>
</table>

There are not enough GNSS/GPS interference reports collected in GADM database outside of MENA region to derive any meaningful conclusion.
Examples of frequency waveforms showing jamming profiles for two examples of publicly available GNSS signal jamming devices.
Could EO provide support in case of GNSS interferences?

EO data is not instantaneous, so it cannot detect current threats. GNSS typically deals with instantaneous activities. Can they have something in common?
Thank you for your attention!

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