## Research Title:

# AirBay - A Distributed Ledger Platform for Trading UAVs' Air Rights

## Primary Investigator:

Name: **Dr. Rami Puzis**

Faculty: **Engineering**

Academic Institute: **Ben-Gurion University of the Negev**

AirBay focuses on creating a decentralized, trustless system for management of airspace-time ownership – a critical part in the future Unmanned Aerial Vehicles (UAV) Traffic Management. To achieve scalability, avoid single point of failure Airbay combines the Blockchain technology with computational geometry and economic aspects of UAV traffic management to provide flexible platform for trading temporal air rights. We consider the urban airspace-time as continuous 4D space. Every 4D asset is represented as a convex polytope owned by a single entity. The 4D assets can be traded in whole or parts using the proposed platform. 4D polytopes can be combined into UAV flight routes, no flight zones, and more.

During the first year of this project, we have defined all constraints for validating the Airbay transactions, such as double-spending and proof of ownership of arbitrary areas at any time. We have extended and implemented computational geometry algorithms used to validate the constraints. These preliminary results were presented at the at the ISTRC 2022 conference.

Nowadays, we are working on implementing Airbay, on the Substrate framework, written in the Rust programming language. Substrate provides tools for creating a custom blockchain, which can then merge into the Polkadot blockchain, a well-known public blockchain.