CARNIVAL

Consistent Aerial Radar-based Navigation In Visibility challenged Areas and Landscapes

Motivation: Recent advances in the miniaturisation and increased performance of radar sensors have given them a huge boost in various fields. In particular, their high frame rate and ability to penetrate many environmental conditions (night, fog, fine dust, smoke, etc.) and interfere with visual sensors have contributed to their increased performance. Visual-Inertial Odometry also resulted in a breakthrough for Global Navigation Satellite System (GNNS) applications in impaired areas. Therefore, the fusion of radar and inertial measurement in this project is expected to enable and revolutionise applications in GNNS and in areas of limited visibility.

Aim The project aims to advance autonomous mobile systems by investigating and developing the next generation of on-board localisation technology using radar inertial odometry.

Intended outcomes: The CARNIVAL project will generate and analyse radar signals to best extract motion information, and use this to extract motion-specific features from a raw radar signal. These are then merged with inertial measurements and fed into a self-calibrating state estimator for localisation and control of highly agile platforms.

Expected impact: The results of the project can be used to overcome the most pressing challenges to equip industrial robotic systems such as autonomously guided vehicles, drones and other robots with environmental awareness capabilities that are currently limited by the harsh environmental conditions that generally prevail in an industrial setting.

Tags: AI, ICT of the future, autonomous (aerial vehicles) driving, sensor technology

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3 YEARS DURATION

March 2021 - February 2024

3 PARTNERS

Austrian: Universität Klagenfurt (project coordinator)

German: Deutsches Zentrum für Luft- und Raumfahrt; Neura Robotics GmbH

€ 0.3 MILLION FUNDIG

The total project costs are € 0.7 million, of which € 0.3 million will be funded.

Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages