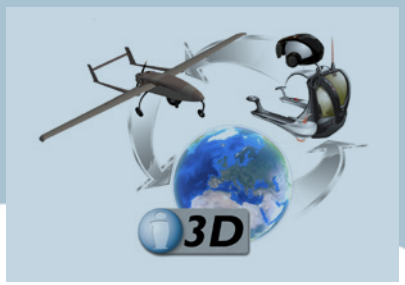

R&D project UAVision – UAS mission planning, monitoring and real-time mapping within a virtual globe environment

Stephan Nebiker (1), Hannes Eugster (1), Marco Mattavelli (2), Hans-Christian Stuber (3), Laurent Zwahlen (4)

(1) FHNW, University of Applied Sciences Northwestern Switzerland, Institute of Geomatics Engineering IVGI, CH-4132 Muttenz, Switzerland
(2) EPFL Ecole Polytechnique Fédérale de Lausanne, GRAM-LSM Microelectronic Systems Laboratory – Multimedia Architecture Research Group, CH-1015 Ecublens, Switzerland
(3) SwissCopter AG, CH-3280 Murten, Switzerland
(4) NuLink SA, CH-2074 Marin, Switzerland

Key words: UAS, virtual globe, geovisualization, augmented reality, virtual reality, rapid mapping, wireless data link, video transmission

The goal of the UAVision R&D project is to develop geospatially enabled software and hardware solutions supporting all phases of typical monitoring and surveillance missions with mini and micro UASs. UAVision combines state-of-the art collaborative virtual globe technologies with advanced geospatial imaging techniques and new wireless data link technologies supporting the combined and highly reliable transmission of digital video, high-resolution still imagery and mission control data over extended operational ranges. UAVision will enable the planning, simulation, monitoring and rapid mapping of UAS missions in applications areas such as monitoring of forest fires, agronomical research, border patrol or pipeline inspection.

The geospatial components of the UAVision project are based on the Virtual Globe Technology i3D of the University of Applied Sciences Northwestern Switzerland (FHNW). i3D is a new high-performance 3D geovisualisation engine supporting the web-based streaming of very large amounts of terrain and POI data. i3D provides the basis for the development of the following UAVision modules: UAVision Mission Planning & Simulation, UAVision Mission Control with Augmented Monitoring and Virtual Monitoring capabilities, UAVision Virtual Piloting and UAVision Rapid Mapping.

The second core component of the UAVision project is a compact and high-performance digital video and imagery data link, which is being developed by the UAVision project members at EPFL Lausanne and NuLink Marin. This data link will support different imaging payload configurations. First prototypes of UAVision components have undergone successful test flights on the latest mini to tactical UAS by the UAVision industry partner SwissCopter / Innosuisse using different imaging payloads.