

Conference Agenda

Session Overview

Date: **Wednesday, 10/Sept/2025**

8:00am - 9:00am	Registration - Day 1
9:00am - 10:30am	Technical Program - UAVG1: Cutting-Edge UAV Robotics: Navigation, Mapping, and Autonomy 1 Location: Kaleva 9:00am - 9:30am A LiDAR-centric approach for reliable UAV navigation Fu Zhang <hr/> 9:30am - 9:45am Multi-sensor Fusion SLAM from the Nadir View for UAV Localization and Mapping Yawen Li, George Vosselman, Francesco Nex <hr/> 9:45am - 10:00am Fast Point Ranking - Robust Cloud Voxelization and Denoising for Lidar Odometry and Mapping in Adverse Weather Conditions Eugeniu Vezeteu, Heikki Hyyti, Ville Kyrki, Juha Hyyppä <hr/> 10:00am - 10:15am Evaluating the performance of a lidar-based autonomous flying system for flying inside forest Aleksi Viljami Karhunen, Teemu Hakala, Väinö Karjalainen, Eija Honkavaara <hr/> 10:15am - 10:30am Low-cost Extrinsic Calibration Between LIDAR and Thermal Camera for Indoor Mapping Benjamin Ronald van Manen, Ville Lehtola, Abeje Yenehun Mersha, Francesco Nex
10:30am - 11:00am	Coffee Break - Day 1 Location: Kaleva Hall
11:00am - 12:30pm	Technical Program - UAVG2: Intelligent UAVs for Forests and Agriculture 1 Location: Kaleva 11:00am - 11:30am Physiological assessment of vegetation using airborne platforms: 25 years of progress in hyperspectral methods Pablo J. Zarco-Tejada <hr/> 11:30am - 11:45am Hyperspectral drone images indicate that green shoulder indices are robust in pre-emergence detection of spruce bark beetle infestation across spatial and temporal scales Luiz Henrique Elias Cosimo, Eva Lindberg, Henrik Persson, Jonas Bohlin, Langning Huo <hr/> 11:45am - 12:00pm Deriving structural and biochemical crop traits from one UAV sensor: Investigating a multiband VNIR/SWIR imaging system for crop trait monitoring Alexander Jenal, Andreas Bolten, Hubert Hüging, Jens Bongartz, Georg Bareth <hr/> 12:00pm - 12:15pm Mapping individual spruces with multispectral drone Jere Johannes Kaivosoja, Samuli Launiainen <hr/> 12:15pm - 12:30pm Differentiating Acute and Chronic Stress in Norway Spruce Using Hyperspectral and Thermal Remote Sensing in Experimental Plots. Rastislav Jakus, Miroslav Blazenec, Matus Pivovar, Jana Maresova, Vivek Singh, Aleksandr Karpov, Natalie Korolyova
12:30pm - 1:30pm	Lunch - Day 1 Location: Kaleva Hall
1:30pm - 3:30pm	Coffee and Posters - Day 1; POS1: Poster session and Industrial exhibition Location: Kaleva Hall Detecting Root Rot Infected Norway Spruce Trees Using Multispectral and LiDAR UAV Data Gustav Boman, Basam Dahy, Esra Sengun, Johanna Witzell, Johan E.S. Fransson

Chlorophyll-a and Turbidity estimation using UAV imagery and machine learning in a tropical eutrophic reservoir

Daniel H. C. Salim, Caio C. S. Mello, Gabriel Pereira, Raian V. Maretto, Frederico S. Machado, Camila C. Amorim

A Multiview UAV Imagery-Based Method for Assessing Spruce Tree Health at the Individual Tree Level

Alva Selina Anttonen, Axel Päivänsalo, Emma Turkulainen, Raquel Alves de Oliveira, Kirsi Karila, Niko Koivumäki, Roope Näsi, Eija Honkavaara

Determining the Amount of Crop Residue Cover Using Image Analysis

Mikael Aleksii Änäkkälä, Roope Rantanen, Antti Lajunen

Applying UAV-based crop height to monitor biomass, N-concentration, and N-uptake in winter wheat

Georg Bareth, Christoph Hütt, Alexander Jenal, Andreas Bolten, Nora Tilly, Hubert Hüging

Mapping Boreal Forest Vitality Using Drone-Based Multispectral Time-Series and Object-Based Classification

Basam Dahy, Esra Sengun, Johanna Witzell, Johan E.S. Fransson

Evaluation of forage grass biomass estimation models using multispectral drone imaging across multiple sites

Raquel Alves de Oliveira, Roope Näsi, Jonas Edström, Joel Pitkänen, Panu Korhonen, Oiva Niemeläinen, Niko Koivumäki, Jere Kaivosoja, Eija Honkavaara

UAV-assisted Multi-Object Tracking and Segmentation of Apples under Occlusions in Orchard

Kaiwen Wang, Lammert Kooistra, Wensheng Wang, João Valente

Remote Sensing Upside Down: Exploring the Potential of Ground-Based Multispectral Cameras for Tree Crown Monitoring

Mona Goebel, Lukas Wolf, Federik Packwitz, Dorota Iwaszczuk

UAV and AI for large-scale monitoring of the effects of climate change on mountain lake areas: the ACLIMO cross-border cooperation project

Chiara Graziani, Andrea Maria Lingua, Francesca Matrone, Alessandra Spadaro

Geospatial information based on UAV for socio-environmental problems in an urban river

Andrea N. Escobedo Tamez, Fabiola D. Yépez-Rincón, Yadira Z. Antonio Durán, Mariana Pérez Martínez, Rogelio Aguilar Cruz, Milena Mesa Lavista, David Clemente Pérez, Nelly L. Ramírez Serrato, Carlos J. Ábrego Góngora

Marine Debris Monitoring on Uninhabited Islands Using UAV-Based 3D Modeling

Sung-Joo Yoon, Tae-Ho Kim

Assessment of smoothing and scale change effects on aquatic emergent vegetation in high spatial resolution image segmentation

Leticia Mayumi Matsuda, Nilton Nobuhiro Imai, Adilson Berveglieri

3:30pm
-
5:00pm

Technical Program - UAVG3: Intelligent UAVs for Forests and Agriculture 2

Location: Kaleva

3:30pm - 3:45pm

Integrating UAS, Computer Vision and AI for Targeted Management of Invasive Insect Pests in Vineyards

Andrea Maria Lingua, Alessio Martino, Francesca Gallitto, Stefania Manca, Paolo Maschio, Valeria Longhi, Filiberto Chiabrande, Marco Grella

3:45pm - 4:00pm

Optimizing high-resolution multi-view drone imaging for detecting foreign grains in gluten-free oat production fields

Roope Näsi, Raquel Alves de Oliveira, Stefan Rua, Ehsan Khoramshahi, Axel Päivänsalo, Oiva Niemeläinen, Eija Honkavaara, Markku Niskanen

4:00pm - 4:15pm

Comparative Analysis of YOLOv8 and YOLOv11 on Tree Detection Using UAV RGB and Laser Scanning Data

Esra Sengun, Samet Aksoy, Elif Sertel, Johan E.S. Fransson

4:15pm - 4:30pm

Individual Tree Species Classification in a Mediterranean Ecosystem using UAV-Acquired Multispectral Images and Machine Learning

Alessandra Spadaro, Andrea Maria Lingua, Filiberto Chiabrande

4:30pm - 4:45pm

Tree stem diameter estimation using inexpensive UAV photogrammetric data and Monte Carlo methods

Borja García-Pascual, Carlos Martín-Cortés, Xin Zhou, [Evgeny Lopatin](#), Mauricio Acuna, Kalle Kärhä

4:45pm - 5:00pm

Assessment of tree detection and segmentation pipelines using Terrestrial Laser Scanning data in orange orchards

[Leticia Ferrari Castanheiro](#), Mariana Batista Campos, Matheus Ferreira Silva, Rahuan Miguel Silva, Renato César Santos, Mauricio Galo, Antonio Maria Garcia Tommaselli

6:00pm

Ice Breaker

Date: Thursday, 11/Sept/2025

8:00am - 9:00am	Registration - Day 2
9:00am - 10:30am	Technical Program - UAVG4: Towards Safe and Scalable Wide-Area BVLOS Operations Location: Kaleva Chair: Eija Honkavaara 9:00am - 9:30am Autonomous BVLOS UAV Operations: From Research to Large-Scale Real-World Deployment Antonios Tsourdos <hr/> 9:30am - 9:45am Hydrogen-Powered Autonomy: Scaling BVLOS UAV Operations in Practice Kelluu Oy <hr/> 9:45am - 10:00am Swarm Intelligence and Systems Thinking: Finding Common Ground for the Engineering of Drone Swarms Solutions <u>Hannu Karvonen</u> , Marjoriikka Ylisiurua, Arto Wallin, Fabrice Saffre, Hanno Hildmann, Vadim Kramar, Sebastian Coffeng <hr/> 10:00am - 10:15am How the engineering of Swarming Behaviors could be drawing on Social Sciences Hanno Hildmann, Regina Nockerts, Sebastian Coffeng, Hannu Karvonen, Johan van der Heuvel, Ricardo van der Pluijm, <u>Fabrice Saffre</u> <hr/> 10:15am - 10:30am A Collaborative GIS for Planning of Urban Drone Launch and Landing Site Locations Miloš Mladenović, Atiullah Saif, Eija Honkavaara, Pyy Kettunen, Mikko Rönneberg, Anssi Jussila, Leo Niemi, Miia Farstad
10:30am - 11:00am	Coffee Break - Day 2 Location: Kaleva Hall
11:00am - 12:30pm	Technical Program - UAVG5: Drone Applications in the Built Environment Location: Kaleva 11:00am - 11:15am Drone based analysis of nocturnal light pollution Görres Grenzdörffer <hr/> 11:15am - 11:30am Cold Region Building Inspection using UAV-based Three-dimensional Reconstruction <u>Nicholas Chodura</u> , Derek Boase, Joshua Woods, Melissa Greeff <hr/> 11:30am - 11:45am IDENTIFICATION OF WASTE MATERIALS IN SEMI-CONTROLLED TEST SITE USING UAV THERMAL AND MULTISPECTRAL IMAGES Hassan Ali Makkawi Gassim, Vincenzo Di Pietra, Marco Piras <hr/> 11:45am - 12:00pm Exploring the Potential of Super-Resolution for Crack Analysis in UAV Facade Orthomosaics of Small Bridges <u>Dahye Jang</u> , Hyunsoo Park, Euiik Jeon <hr/> 12:00pm - 12:15pm An UAV for 3D Tree Surveying Method as an Improvement for Dam Construction Environmental Impact Manifestation in Mexico Kevin D. Rodríguez González, Fabiola D. Yépez-Rincón, Jacinto Treviño Carreón, Ivone Zapata Wah, Adrián L. Ferriño Fierro, Carlos C. Aguilar Treviño, Aylet Vega Aguilar, Roberto Huerta García, Yadira Zulema Antonio Durán <hr/> 12:15pm - 12:30pm ResQDrone: Autonomous Indoor Quadcopter for Multi-Layered Mapping in Crisis and Disaster Management Scenarios Marco Cella, Jürgen Biber, Pierrick Bournez, Jules Salzinger, Verena Widhalm, Francesco d'Apolito, Felix Bruckmüller, Christoph Sulzbachner, Phillip Fanta-Jende
12:30pm - 1:30pm	Lunch - Day 2 Location: Kaleva Hall

1:30pm - 2:00pm	Industry keynote: Terrasolid Oy Location: Kaleva
1:30pm - 3:30pm	Coffee and Posters - Day 2 Location: Kaleva Hall <hr/> Addressing GNSS Vulnerabilities in AAM: A Multi-Modal UAV Testbed for Redundant and Reliable Navigation <u>Felix Rocco Matzke</u> , Tushar Jayesh Barot, Shreeja Sridharan, Nikolaus Ammann, Christoph Kessler, Hans-Gerd Maas, Frank H. P. Fitzek, Anette Eltner <hr/> Smart Drones, Smarter Learning: Federated Self-learning Minimal Learning Machine Classifier for Real-Time Hyperspectral Image Classification Anna-Maria Raita-Hakola, Xinying Kilpi-Chen, Ilkka Pölonen <hr/> Under-canopy UAV Solutions for Forest Inventory – Challenges and Opportunities Xinlian Liang, Guangzu Liu, Xintong Dou <hr/> Autonomous Drone Navigation in Forest Environments Using Deep Learning Guglielmo Del Col, Väinö Karjalainen, Teemu Hakala, Eija Honkavaara <hr/> Precise georeferencing of RGB and multispectral drone images without ground control points <u>José Gonçalves</u> , Ana Bio, Manuel Meyer <hr/> Under-Canopy UAV Global Path Planning for Tree DBH Estimation Using LiDAR <u>Yang Chen</u> , Shuhang Zhang, Qian Sun, Hao Xiong, Wuming Zhang <hr/> ORBIT: Optimized Routing for Bridge Inspection Toolkit. An open-source UAS flight path planning tool for comprehensive bridge inspections under realistic constraints <u>Erkki Tobias Bartczak</u> , Maarten Bassier, Maarten Vergauwen <hr/> On Voxel-Based Sampling of Planar Surface Areas from Photogrammetric UAV Data <u>Petri Rönnholm</u> , Matti T. Vaaja <hr/> An Automated Framework for Cadastral Parcel Adjustment Using UAV Orthophotos, SAM, and ICP <u>Deni Suwardhi</u> , Muhammad Ihsan, Ratri Widyastuti, Nabila Sofia Eryan Putri, Sella Lestari Nurmaulia, Andri Hernandi <hr/> UAS for Landscape and Architectural Survey: An Innovative Interdisciplinary Approach of Learning by Doing in the Bachelor Programs at Politecnico di Torino Alessio Martino, Filiberto Chiabrande, Andrea Maria Lingua <hr/> Bimodal MorphoCopter for Wildfire Suppression: Transforming Quadcopters to All-Terrain-Vehicles (ATV) <u>Osman ACAR</u> , Eija HONKAVAARA, Selahattin SEFACI <hr/> Real time solar panels heat point's detection with EDGE ViTs using thermal drone imagery <u>Mouad Jabrane</u> , Imane Sebari, Kenza Ait El Kadi <hr/> Application of UAV orthophoto and thermal imaging for municipal solid waste landfills monitoring Olga Brovkina, Lukáš Fajmon, Miroslav Píkl, František Zemek
3:30pm - 5:00pm	Technical Program - UAVG6: Novel UAV Computer Vision Systems and Algorithms Location: Kaleva <hr/> Real-Time Bundle Adjustment for Ultra-High-Resolution UAV Imagery Using Adaptive Patch-Based Feature Tracking <u>Selim Ahmet Iz</u> , Francesco Nex, Norman Kerle, Henry Meissner, Ralf Berger <hr/> A Robust Integrated Approach for Near Real-Time Seamless Orthomosaic Generation Using Off-the-Shelf UAVs for Ultra-High Resolution Mapping Applications <u>Muhammad Farhan Humayun</u> , Ali Salmasi, Jiaqiang Zhang, Tomi Westerlund, Jukka Heikkonen <hr/> Robust UAV Image Mosaicking Using SIFT and LightGlue Sung Hyeon Kim, <u>Taejung Kim</u> <hr/> Distortion Invariant Optical Calibration for Lightweight Airborne Imaging Spectrometry Julien Burkhard, Jesse Lahaye, <u>Laurent Valentin Jospin</u> , Jan Skaloud <hr/> Systematic Error Reduction in UAV-Based Laser Scanning by Using RTS

André Cornelißen, Ansgar Dreier, Felix Esser, Gereon Tombrink, Lasse Klingbeil, Heiner Kuhlmann

Misalignment estimation of a lightweight laser scanning system with static calibration

Marcela Vale Machado, Antonio Maria Garcia Tommaselli, Leticia Ferrari Castanheiro, Thaisa Aline Correia Garcia, Thiago Tiedtke Reis

7:00pm

Conference Dinner

Date: Friday, 12/Sept/2025

8:00am - 9:00am	Registration - Day 3
9:00am - 10:30am	Technical Program - UAVG7: Cutting-Edge UAV Robotics: Navigation, Mapping, and Autonomy 2 Location: Kaleva 9:00am - 9:30am Beyond the Next-Best-View: Machine Learning and Computer Vision for the Exploration and 3D Mapping of Large Scenes Vincent Lepetit <hr/> 9:30am - 9:45am Autonomous UAV 3D Reconstruction using Prediction-Based Next Best View <u>Ziwen Wang</u> , Bashar Alasdik, Francesco Nex <hr/> 9:45am - 10:00am Combining soft robotics and active-laser induced fluorescence for environmental monitoring: Evaluating the drone-scenario of the I-Seed project Lammert Kooistra, Hasib Mustafa, Domantas Girzidas, Chenglong Zhang, Berry Onderstal, Harm Bartholomeus <hr/> 10:00am - 10:15am SMARTNav: A Visual-Inertial Dataset for Reliable Robotic State Estimation <u>Hojat Mirtajadini Goki</u> , Abeje Mersha, Mohammad Aldibaja <hr/> 10:15am - 10:30am Integrating Pre-Harvest UAV Scans to Enhance Harvester Tree Localization Accuracy Evgeny Lopatin, Kari Väätäinen, Harri Kaartinen, Heikki Hyyti, Lauri Sikanen, Yrjö Nuutinen, Mauricio Acuna
10:30am - 11:00am	Coffee Break - Day 3 Location: Kaleva Hall
11:00am - 12:15pm	Technical Program - UAVG8: Uncrewed Remote Sensing Systems for Aquatic Environments Location: Kaleva 11:00am - 11:15am Novel robotic mapping system for freshwater environments <u>Jukka Matias Mäki-Leppilampi</u> , Heikki Hyyti, Harri Kaartinen <hr/> 11:15am - 11:30am Comparative Analyses for Determining Shallow Water Bathymetry from UAVs: a Case Study in the Adriatic Sea Tea Duplančić Leder, Nenad Leder <hr/> 11:30am - 11:45am Performance Evaluation of Drone Operated Dual Waveform Bathymetric LiDAR Joonas Kousa, Teemu Hakala, Antero Kukko, <u>Harri Kaartinen</u> <hr/> 11:45am - 12:00pm Phenological and Species-Level Classification of Aquatic Invasive Plants Using UAV Multispectral Imagery and Machine Learning Daniel H. C. Salim, Caio C. S. Mello, Gabriel Pereira, Raian V. Maretto, Frederico S. Machado, Camila C. Amorim <hr/> 12:00pm - 12:15pm UAV for flooding risk assessment in a new Dam Construction in Northeast Mexico Aylet Aguilar Vega, Fabiola D. Yépez-Rincón, Kevin D. Rodríguez Gonzalez, Dariela Vázquez, Adrián L. Ferriño Fierro, Víctor H. Guerra Cobián
12:15pm - 1:15pm	Lunch - Day 3
1:15pm - 2:45pm	Technical Program - UAVG9: Next-Generation AI for UAVs Location: Kaleva 1:15pm - 1:30pm Advancements on Semantic Real-Time UAV Mapping <u>Marc David Haubenstock</u> , Jules Salzinger, Michael Schwingshackl, Felix Bruckmüller, Christoph Sulzbachner, Phillipp Fanta-Jende <hr/> 1:30pm - 1:45pm Implementing real-time wildfire detection using lightweight object-detection models and machine vision sensor on Raspberry Pi 5: Fireframe, a practical framework <u>Jukka Joutsalainen</u> , Maxim Vitikainen, Juuso Lehrbäck, Alexander Goldhill, Anna-Maria Raita-Hakola

1:45pm - 2:00pm

An End-to-End UAV–Cloud–AI Pipeline for Infrared-Based Real-Time Person Detection in SAR Missions

Seunghyun Kim, Jeonghyo Oh, Younggon Oh, Impyeong Lee

2:00pm - 2:15pm

The End of Overfitting for UAV Applications - Self-Supervised Pretraining on Multispectral UAV Data

Jurrian Doornbos, Önder Babur

2:15pm - 2:30pm

Domain Generalization in Deep Learning for Forest Health Monitoring Using Multispectral UAS Data

Emma Jenni Johanna Turkulainen, Raquel Alves de Oliveira, Niko Koivumäki, Päivi Lyytikäinen-Saarenmaa, Roope Näsi, Mikko Peltö-Arvo, Johanna Tuviala, Eija Honkavaara

2:30pm - 2:45pm

Tree Species Classification Using Majority Voting Approach on UAV Raw Images

Tomohiro Mizoguchi, Daisuke Tsukano, Hideki Ogawa

2:45pm

Closing Ceremony
