

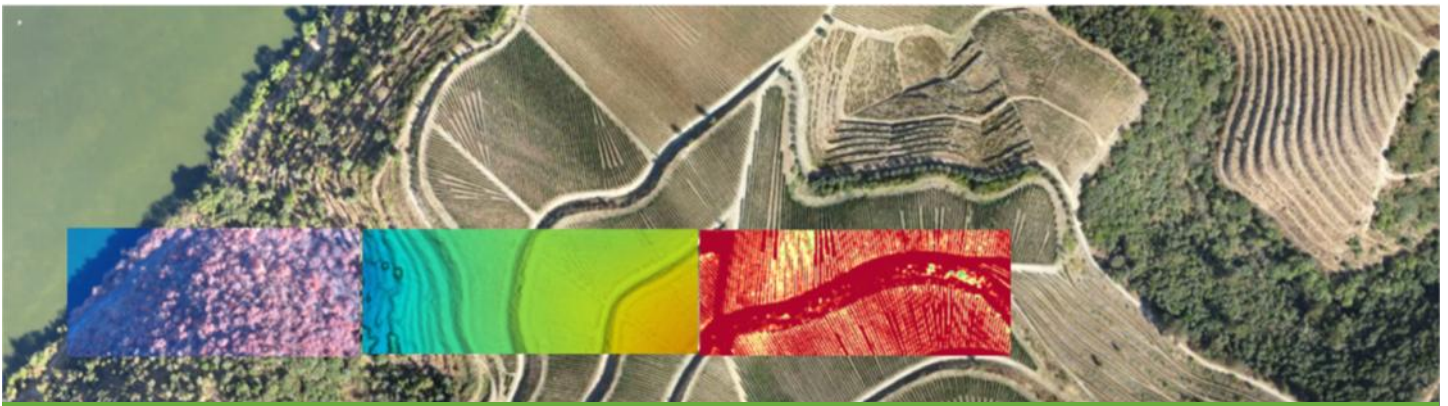


INESCTEC  
ASSOCIATE LABORATORY  
PORTUGAL



# → UAS<sub>4</sub>Enviro2017

small Unmanned Aerial Systems for Environmental Research  
5th Edition



## PROGRAMME

28 – 30 June 2017 | UTAD | Vila Real, PORTUGAL



**DAY 1 - Wednesday 28 June 2017 | UTAD, Vila Real, Portugal**
**09:00-10:00 Registration.**
**S1 - Opening Session (10:00 - 11:30)**  
 Session chair: **Joaquim J. Sousa**, UTAD

**10:00-10:15 Welcome and Conference Objectives.**

UTAD's Representative and Joaquim J. Sousa (on behalf of the conference Organisation).

**10:15-11:00 Keynote speaker: UAV 3D photogrammetric models: bigger and faster forever, is this the Graal?**

Marc Pierrot-Deseilligny, École Nationale des Sciences Géographiques, France.

**11:00-11:30 RSPSoc Session.**

Fleur Visser.

**11:30-12:00 Coffee Break**
**S2 - Methods and Techniques (12:00 - 13:00)**

 Session chair: **Fleur Visser**, University of Worcester and **Jean-Christophe Poisson**, CLS

**12:00-12:15 The integration of drones in Internet of Things for Conservation biology.**

Margarita Mulero-Pázmány.

**12:15-12:30 Crucial factors to consider during the assessment and procurement of drone systems for forestry, conservation and environmental applications exemplified in the case of the setup of a monitoring system for a regional conservation area in San Martin, Peru.**

Patrick Ribeiro.

**12:30-12:45 Quantifying and Validating Rapid Geomorphic Evolution, a Monitoring and Modelling Case Study.**

Rory Scott, Neil Entwistle and George Heritage.

**12:45-13:00 The effect of spatial resolution of UAS-based thermal imagery on turbulent heat flux estimates.**

Claire Brenner, Matthias Bernhardt and Karsten Schulz.

**13:00-14:30 Lunch**
**S3 - Forestry and Vegetation Monitoring (14:30 - 15:45)**

 Session chair: **Serge Wich**, Liverpool John Moores University and University of Amsterdam and **Anna Zmarz**, University of Warsaw

**14:30-14:45 Multi-seasonal monitoring of Acacia longifolia through UAS: potential for detection of a biocontrol agent.**

Nuno César de Sá, Bruno Pato, Elizabete Marchante, Magno Guedes, Paula Castro, Raquel Caldeira, Ricardo Matos, Sabrina Carvalho and Hélia Marchante.

**14:45-15:00 Using multitemporal UAV imagery to estimate tree height growth in Pinus pinea plantations in Portugal.**

Juan Guerra-Hernández, Eduardo González-Ferreiro, Paula Soares, Margarida Tomé, Vicente Monleon and Ramon A. Díaz-Varela.

**15:00-15:15 Generation of Canopy Height Model based on Point Clouds and Spectral Data: a Case Study on Grapevine.**

Francisco Javier Mesas-Carrascosa, José Manuel Peña Barragan, Ana Isabel de Castro Megías, Jorge Torres Sánchez, Francisco Manuel Jimenez Brenes, Alfonso García-Ferrer and Francisca López Granados.

**15:15-15:30 Using Unmanned Aerial Vehicles to detect flowering of an invasive tree as a proxy to assess the efficiency of a biocontrol agent.**

Nuno César de Sá, Paula Castro, Sabrina Carvalho, Elizabete Marchante, Francisco A. López-Núñez and Hélia Marchante.

**15:30-15:45 Cliff vegetation monitoring using close range photogrammetry and AUS: technical issues and practical hints.**

Maurizio Buonanno, Giovanna Aronne, Sandro Strumia, Mariella Danzi, Antonio Santo and Annalisa Santangelo.

**15:45-16:15 Coffee Break**
**S4 - Agricultural Monitoring (16:15-17:45)**

 Session chairs: **José Alberto Gonçalves**, University of Porto and **Lane Scher**, The Morton Arboretum

**16:15-16:30 Use of 3-D hydrologic modelling and UAV-photogrammetry to characterize the phytoextraction efficiency of poplar trees in a cadmium contaminated agricultural field.**

Alessandra Capolupo, Paolo Nasta, Mario Palladino, Elena Cervelli, Lorenzo Boccia and Nunzio Romano.

**16:30-16:45 Chestnut decline monitoring in Portugal using Unmanned Aerial Systems.**

Luís Martins, João P. Castro, Joaquim J. Sousa, Ricardo Bento and Luís Pádua.

**16:45-17:00 Automatic chestnut trees monitoring by aerial photographs obtained by unnamed aerial vehicle.**

Pedro Marques, Luís Pádua, Telmo Adão, Jonáš Hruška, Joaquim J. Sousa, Emanuel Peres, Luís M. Martins and António Sousa.

**17:00-17:15 Vineyard detection from the combination of RGB and red edge-based UAS imagery.**

Luís Pádua, Telmo Adão, Jonáš Hruška, Pedro Marques, Joaquim J. Sousa, António Sousa, Emanuel Peres and Raul Morais.

**17:15-17:30 Evaluation of winter crop damage using UAV-based multispectral imagery.**

Łukasz Jełowicki, Wojciech Ostrowski, Konrad Sosnowicz, Katarzyna Osińska-Skotak and Krzysztof Bakuła.

**17:30-17:45 UAS-based hyperspectral sensing methodology for vineyard anomalies monitoring.**

Telmo Adão, Emanuel Peres, Luís Pádua, Jonas Hruska, Joaquim J. Sousa and Raul Morais.

**17:45-19:00 Poster Session (Port wine toast)**

## DAY 2 - Thursday 29 June 2017

**09:30-10:15** **Keynote speaker: UAS for coastal zone mapping and monitoring.**

José Alberto Gonçalves, Faculty of Sciences of University of Porto, Portugal.

**10:15-10:40** **Invited speaker: Characterization of the UAVs sector in Portugal (and international trends).**

**Gonçalo Antunes Martins:** is an airline pilot since 2008, former flight instructor and invited Professor. Skilled Quality Auditor, holds a degree in Aeronautical Sciences and a Master's Degree in Air Transportation Operations. In May 2016, founded the Portuguese Association for Unmanned Aircraft and has been elected its President for the following 4 years.

### S5 - Water and Coastal Monitoring (10:40 - 11:40)

Session chairs: **Gil Gonçalves**, INESC Coimbra/UC and **Gabriel Goyanes**, University of Buenos Aires

**10:40-10:55** **HyDrones: A new service for monitoring water bodies, application to the observation of a tidal bore in the Garonne river.**

Jean-Christophe Poisson, Guillaume Valladeau, Olivier Lauret and Pierre Prandi.

**10:55-11:10** **Advanced Refraction Correction for UAV-SfM Models Of Rivers: A Case Study From The Rio Palancia, Spain.**

Carlos Antonio Puig Mengual and Amy Woodget.

**11:10-11:25** **Combining UAV photogrammetry and open source software for fast and effective assessment of coastal erosion – The case study of South Cova da Gala's beach, Portugal.**

Gil R. Gonçalves, Marco Cunha and João Duarte.

**11:25-11:40** **RPAS as a new tool for the study of sand dunes in coastal environments: a case study in the south Atlantic area of Spain.**

Luis Barbero, Santiago García-López, Juan Antonio López-Ramírez and Juan José Muñoz.

**11:40-12:10** **Coffee Break**

### S6 - Natural and man-induced hazards (12:10 - 13:10)

Session chairs: **Steven Longmore**, Liverpool John Moores University and **Israel Quintanilla**, Technical University of Valencia

**12:10-12:25** **UAS as Tools for Rapid Detection of Storm-Induced Morphodynamic Changes at Sancti Petri Spit, Sw Spain.**

Lara Talavera, Laura Del Rio, Javier Benavente, Luis Barbero and Juan Antonio López.

**12:25-12:40** **Very high-resolution aerophotogrammetric survey of the 2014/2015 lava flow field of Fogo volcano (Cape Verde).**

Gonçalo Vieira, Pedro Pina, Carla Mora, Rui Fernandes, Pedro Almeida, Stéphanie Dumont, Bento Martins, Carla Candeias, Carlos Oliveira and Ricardo S. Ramalho.

**12:40-12:55** **Levee risk area detection based on the UAS platform data - integration of multispectral imagery and LIDAR point cloud.**

Krzysztof Bakula, Adam Salach, Magdalena Pilarska and Zdzisław Kurczyński.

**12:55-13:10** **UAS-based change detection of the Lärchberg-Galgenwald landslide, Austria.**

Gernot Seier, Wolfgang Sulzer and Paul Lindbichler.

**13:10-14:30** **Lunch**

### S7 - Wildlife and Habitat Monitoring (14:30 - 15:45)

Session chairs: **Paula Fortuny**, Autel Europe GmbH and **Francisco Mesas Carrascosa**, University of Cordoba

**14:30-14:45** **UAS identification of liana infestation in tropical forests, Malaysia.**

Catherine Waite, Doreen Boyd, Geertje van der Heijden and Richard Field.

**14:45-15:00** **Using a UAV to monitor temperate intertidal habitats: an assessment of photogrammetry and object-based image analysis techniques.**

Paula Lightfoot, Nicholas Polunin, Catherine Scott and Clare Fitzsimmons.

**15:00-15:15** **Can drones be used to estimate orangutan densities?**

Serge Wich, Molly Hennekam, Matt Nowak, Keeyen Pang, Alexandra Robinson, Graham Usher, Benoit Goossens, Danica Stark, Marc Ancrenaz and Lian Pin Koh.

**15:15-15:30** **Adapting astronomical source detection techniques to detect unresolved animal sources in thermal images obtained by unmanned aerial systems.**

Maisie Rashman, Maria De Juan Ovelar, Steven Longmore and Serge Wich.

**15:30-15:45** **Testing the Feasibility of Unmanned Aerial Vehicles and Thermal Imaging for Ungulate Surveys.**

Julia Witczuk, Stanisław Pagacz, Anna Zmarz and Maciej Cypel.

**15:45-16:15** **Coffee Break**

### S8 – Other applications (16:15-17:30)

Session chairs: **Ramón Díaz Varela**, University of Santiago de Compostela and **Karel Kuzelka**, Czech University of Life Sciences

**16:15-16:30** **UAV Based Survey of the West Antarctic Environment.**

Anna Zmarz, Mirosław Rodzewicz, Malgorzata Korczak-Abshire, Katarzyna Chwedorzewska, Maciej Dąbski and Izabela Karsznia.

**16:30-16:45** **UAV Technology for Detection and Characterization of Pathologies in Plates of the Concrete Covering of Slopes.**

Byron Morales and Alfonso Tierra.

**16:45-17:00** **Astronomy meets conservation biology: Thermal profiling as a tool for the automated classification of species in UAVs thermal footage analysis pipeline.**

Maria de Juan Ovelar, Maisie Rashman, Steven Longmore and Serge Wich.

**17:00-17:45** **Round Table and introduction of UAS4Enviro2018 Venue** (moderated by all the session's chairs)

Conclusions and Discussion about the conference's main topics.

**18:00-18:45** **Poster Session**

**20:00 – Conference Dinner**

**DAY 3 - Friday 30 June 2017 – Industry Day | UTAD, Vila Real, Portugal**

 Session chairs: **Organisation's members**

**09:30-10:00** **Invited speaker: UAVs - Regulations and Law enforcement**  
 Prof. Arthur Cracknell: University of Dundee, UK & Co-Editor-in-Chief of the International Journal of Remote Sensing

**10:00-10:45** **Photogrammetric processing of UAV acquisition with the free open source software MicMac**  
 Marc Pierrot-Desseilligny, École Nationale des Sciences Géographiques, France.

**Summary:** MicMac is a free open source photogrammetric suite. It is rather targeted for professional users who need (want) to control the complete photogrammetric pipeline. Its "interface" is based on command line which gives it the reputation of being complex. In this presentation I will try to denounce this reputation of complexity by demonstrating the following processing chain on a real-case study:

- computation of relative orientation;
- computation of absolute orientation in 3 cases : with GCP, with embedded GPS and with both;
- computation of DSM and ortho photo.

**10:45-11:30** **Drones: powerful tools for sustainable forestry management**  
 Patrick Ribeiro, OpenForests

**Summary:** Facing the current problems of large scale plantations, forestry operations need to become in general more ecological and socially adapted to stay productive for an unlimited period of time. Although the number of sustainable forestry operations is increasing worldwide, considerable investments are needed to unleash the full potential of such projects. The limited capital flow into the sustainable forestry sector is caused - amongst others - by the present information situation which is diffuse, scarce and non-transparent. OpenForests is engaged in developing and providing tools which allow a solid and transparent information basis for decision makers like forest managers and investors. In this context, drones play a major role. From visual project presentations to extensive data acquisition and analysis, drones allow a new level of transparency facilitating investment decisions, enabling a data driven forest management and controlling, and helping to increase the project presence and visibility on the market. OpenForests' CEO and drone expert will present some of the drone-based applications **Summary:** in the forestry and conservation sector. He will elucidate with practical examples how drones can assist in sustainable forestry operations providing a wall to wall transparency amongst all stake-holders

**11:30-12:00** **Coffee Break**

**12:00-13:00** **Topcon solutions for UAV's and mass data techniques integration.**  
 António Santos, Topcon

**Summary:** Photogrammetry and LIDAR represents the main basis of the mass data acquisition techniques available in the geomatics market currently. Topcon is present in the global market, developing and commercializing worldwide several solutions of hardware and software related with those mass data techniques, since more than 10 years.

Regarding specifically UAV's solutions, Topcon is the exclusive worldwide distributor of the rotary wing Falcon 8, and the fixed wing Sirius Pro, respectively developed by two German companies, owned by the global giant Intel: Ascending Technologies and MAVinci.

On this presentation, we will talk about the capability of integration of UAV's data with laser scanning and mobile mapping data, and possible applications of such integration of data from different sensors, with different characteristics, accuracies and resolutions, in the same software platform.

**13:00-14:30** **Lunch**

**14:30-15:15** **The MAPP platform: remote sensing for agriculture based on satellite and drone data**  
 Vasco Pimenta, Spinworks

**Summary:** MAPP is an online platform for dissemination of remote sensing data to farm managers. It leverages medium-resolution satellite data to provide information on crop evolution throughout the season, and allows visualization of high-resolution drone data. Drone data is processed in order to extract useful information that can provide insights for farm management at the individual plant level, and a number of tools are provided to allow fine-grained intervention in the field.

**15:15-16:15** **Live demonstration: use of drones for inspection and security applications; data acquisition for 3D modelling and surveying**  
 António Santos, Topcon

**16:15-16:30** **Closing session**



## Posters Presentation

**28 and 29 June 2017 | UTAD, Vila Real, Portugal**

1. **Evaluation of urban green spaces with UAV-based photography, in Quito, Ecuador.**  
César Alvarez, Richard Vilchez, Xavier Cumbajin, Henry Mejia and Ana Teodoro.
2. **High resolution mapping of geomorphological hazard exposure of Antarctic infrastructures using UAVs.**  
Gabriel Goyanes, Gonçalo Vieira, João Branco, Simone Girst and Claudio Matko.
3. **Development of QGIS plugin to obtain parameters/elements of treetops with UAV imagery.**  
Pedro Silva, Ana Teodoro, Lia Duarte and Óscar Moutinho.
4. **UAV application for fast pathfinding in Chinese Antarctic expedition.**  
Chi Ma, Baogang Zhang and Xiao Cheng.
5. **Precision Engineering for Gully Erosion Control Within the Humid Tropics of Nigeria: a Remote Sensing Approach.**  
Luke Uzoigwe and Stanley Maduakolam.
6. **Change Assessment of The Douro Sand Spit using Fixed Wing UAVs.**  
José Gonçalves, Joaquim J. Sousa and Renato Henriques.
7. **Using a UAS for Environmental Monitoring of the Marine Environment.**  
Steven Lloyd, Paul Lepper and Simon Pomeroy.
8. **Towards an unmanned system optimized for invasive plant species mapping.**  
Petr Dvořák, Tomáš Bartaloš, Josef Brůna, Michaela Vítková and Jana Müllerová.
9. **Habitat extent and condition assessment using multispectral Remotely Piloted Aircraft System imagery in the NW mountains of Galicia (NW Spain).**  
Ramón Alberto Díaz-Varela, Boris Alejandro Hinojo Sánchez, Marco Rubinos Román, Sílvia Calvo Iglesias and Emilio Rafael Díaz Varela.
10. **Target influence in ground control point identification using high resolution aerial images.**  
Jonáš Hruška, Manuel Vasques, Luís Pádua, Telmo Adão, Joaquim J. Sousa, António Sousa, Emanuel Peres, José Alberto Gonçalves and José Manuel Martinho Lourenço.
11. **Interactive flight height and speed charts.**  
Karel Kuzelka and Peter Surovy.
12. **Accuracy assessment of point clouds from LiDAR and image matching acquired with the UAS platform.**  
Adam Salach, Krzysztof Bakula, Magdalena Pilarska, Wojciech Ostrowski and Konrad Górski.
13. **Smart Coverage Path Planning: Energy efficiency in Small Unmanned Aerial Vehicles Systems (S-UAVS).**  
Mohamed Dahman, Israel Quintanilla García, Naoufal Raissouni, Pablo Morcillo, Débora Robles and Samir El Adib.
14. **Delineation of Rill Soil Erosion from UAV-Borne Remote Sensing Data.**  
Radek Malinowski and Goswin Heckrath.
15. **Advantages of Using UAVs Data to Study Rocky Coasts Geomorphology: The Case Study of the São Paio Rocky Littoral, Portugal.**  
Mafalda Lopes, Miguel Marques and Alberto Gomes.
16. **UAVs Data for Monitoring Rescue Archeological Excavations: Rodo, Bispeira 8 and Vau Sites in Ribeiradio Reservoir, Vouga Catchment (Portugal).**  
Sérgio Monteiro Rodrigues, Miguel Marques, Sérgio Gomes, Alcía Ameijenda Iglésias, Carmen Manzano and Alberto Gomes.
17. **UAVs Orthoimages for Identifying an Mapping Geomorphic Inheritance of the Quaternary Glaciers at the Soajo-Peneda Mountais, Portugal.**  
António José M. de Oliveira L. Silva, Miguel Marques, Eva Calicis, Cátia Martins, Péres-Alberti Augusto and Alberto Gomes.
18. **RPAS for precision greenkeeping and improved water management in golf courses.**  
Juan Antonio Lopez-Ramirez, Lara Talavera Madrigal and Luis Carlos Barbero Gonzalez.
19. **The right UAS for your agroforestry application: a web-based decision support system.**  
Ricardo Pereira, Manuel Pimenta, Telmo Adão, Luís Pádua, Jonáš Hruška, Jakub Vanko, Joaquim J. Sousa, Emanuel Peres and Raúl Morais.
20. **A UAV and SFM approach as a fast and complete methodology on morphostructural analysis.**  
João Duarte, Marco Cunha, Gil Gonçalves and Fernando Figueiredo.
21. **The tales of Akerateheils – can RPAS based mapping of ancient graves improve our understanding of the Blemmy culture?**  
Gidske L. Andersen and Knut Krzywinski.
22. **UAVs for sustainable forestry.**  
Patrick Ribeiro.
23. **Comparison of point clouds obtained from terrestrial lidar (TLS) and UAV vertical surveying in Forte Novo beach and cliff (Quarteira, Portugal).**  
Joao Manuel Calvao Rodrigues.
24. **Combining UAS and historical aerial imagery SfM photogrammetry for cultural heritage documentation and research: the case of Torre de Modorra (Vinhais, Northern Portugal).**  
João Fonte, José Manuel Costa-García, Óscar Moutinho, Ana Rodrigues, Lia Duarte and José Alberto Gonçalves.

Posters Presentation

28 and 29 June 2017 | UTAD, Vila Real, Portugal

25. **UAS photogrammetry for the geoarchaeological survey of ancient mining landscapes.**  
Luis Gonçalves-Seco, João Fonte, Alexandre Lima and José Alberto Gonçalves.
26. **Change detection and spatial dynamics of land cover degradation in the South East Aurès (Algeria).**  
Hassen Benmessaoud and Abdelhafid Bouzekri.
27. **The Tree Observatory as a test bed for UAS applications to study trees.**  
Lane Scher and Chuck Cannon.
28. **Photogrammetric Analyses for High Resolution Bathymetry of the Gepatsch Reservoir (Tyrol, Austria).**  
Boschi Maximilian, Boschi Peter, Schletterer Martin
29. **DeepEye: A UAS-based Deep Learning Framework for Detecting Damaged Buildings.**  
Hossein Arefi, Fatemeh Alidoost
30. **UAV based sediment mapping along gravel bars in alpine rivers.**  
Hauer C. , Schachner, A., Boschi, M., Boschi, P., Schletterer, M.