FIG WORKING WEEK 2023
28 May - 1 June 2023 Orlando Florida USA

Protecting Our World, Conquering New Frontiers

TS05I: APPLICATIONS OF LIDAR IN ENGINEERING GEODESY

Implementation and Optimization of a complete process of Collection, Classification and Exploitation of LIDAR data

- **Audrey ALAJOUANINE, France**
- **Mohamed Khalil MASMOUDI, Tunisia**

Organized By
NSPS
FIG INTERNATIONAL FEDERATION OF SURVEYORS

Diamond Sponsors
esri THE SCIENCE OF WHERE
Trimble

Summary

- General context

- Organization of the flight missions by UAV

- Classification of Lidar Point Cloud

- Exploitation of Lidar data

- Conclusion

- **General context**
- *Organization of the flight missions*
- *Classification of Lidar Point Cloud*
- *Exploitation of Lidar data*
- *Conclusion*

General context :   How can we optimize the process of collecting, processing and using LIDAR data?

Reduce the very high cost of map products generated from LIDAR data

Minimize the processing time of LIDAR point clouds

Avoiding manual processing of LIDAR data

- **General context**
- *Organization of the flight missions*
- *Classification of Lidar Point Cloud*
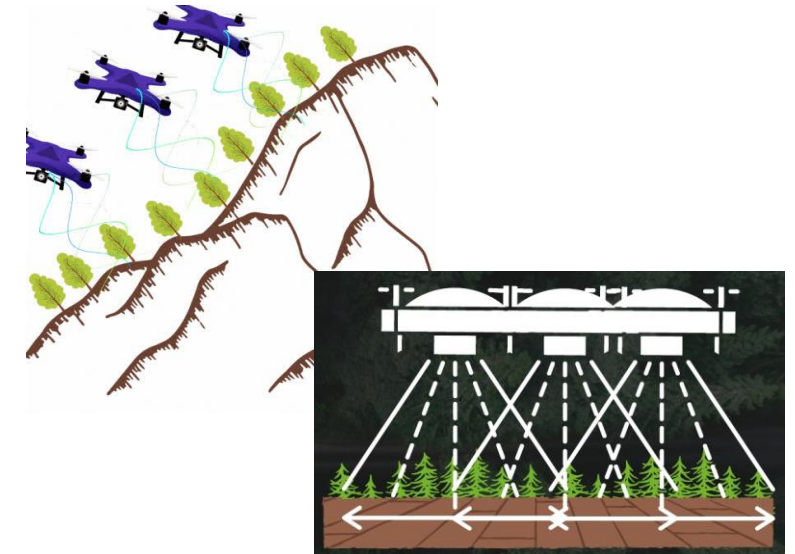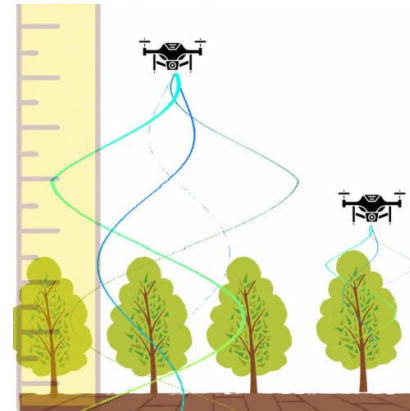- *Exploitation of Lidar data*
- *Conclusion*

General context

| Improve and specify the flight mission organization parameters for each study area | Implementation of a classification process of LIDAR point clouds for each area according to land use | Optimize the methods of exploitation of LIDAR data |

FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting Our World, Conquering New Frontiers

- *General context*
- **Organization of the flight missions**
- *Classification of Lidar Point Cloud*
- *Exploitation of Lidar data*
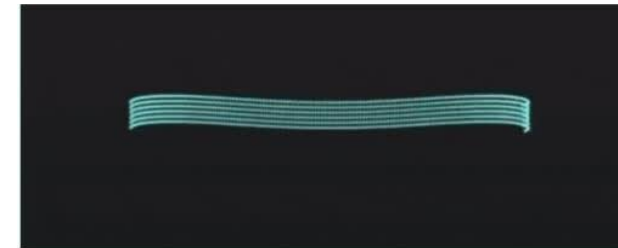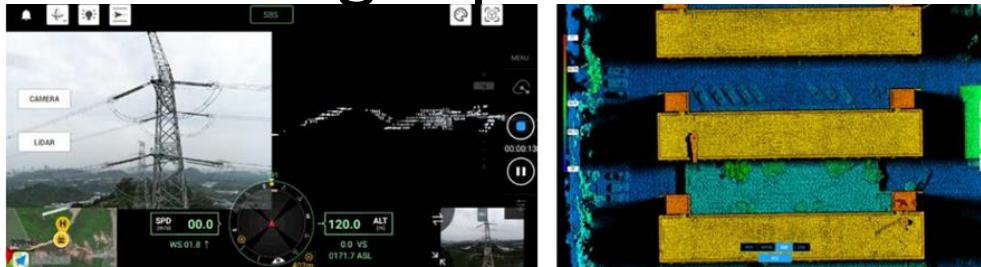- *Conclusion*

Organization of the flight missions : Define the parameters for the flight mission in each type of project

- Point Cloud density

- Flying height

- Terrain follow mode

- Speed

- Overlap

- Scanning mode

Organized By

NSPS

FIG INTERNATIONAL FEDERATION OF SURVEYORS

Diamond Sponsors

esri THE SCIENCE OF WHERE

Trimble.

FIG WORKING WEEK 2023
28 May - 1 June 2023 Orlando Florida USA
Protecting Our World, Conquering New Frontiers

- *General context*
- **Organization of the flight missions**
- *Classification of Lidar Point Cloud*
- *Exploitation of Lidar data*
- *Conclusion*

Organization of the flight missions : Define the parameters for the flight mission in each type of project

- Scanning repetitive mode

- Scanning non-repetitive mode

Organized By
NSPS
FIG INTERNATIONAL FEDERATION OF SURVEYORS

Diamond Sponsors
esri THE SCIENCE OF WHERE
Trimble

FIG WORKING WEEK 2023
28 May - 1 June 2023 Orlando Florida USA
Protecting Our World, Conquering New Frontiers

- General context
- Organization of the flight missions
- **Classification of Lidar Point Cloud**
- Exploitation of Lidar data
- Conclusion
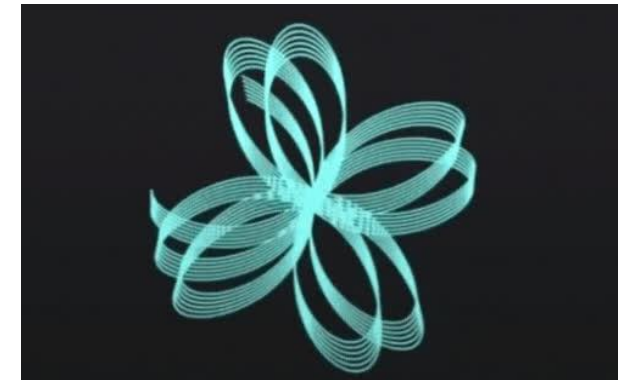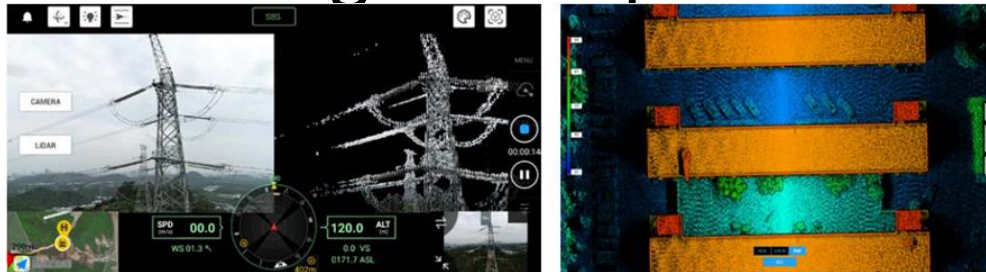
Classification of Lidar Point Cloud :

Create an automatic classification process of LIDAR point clouds on 5 study areas according to their characteristics
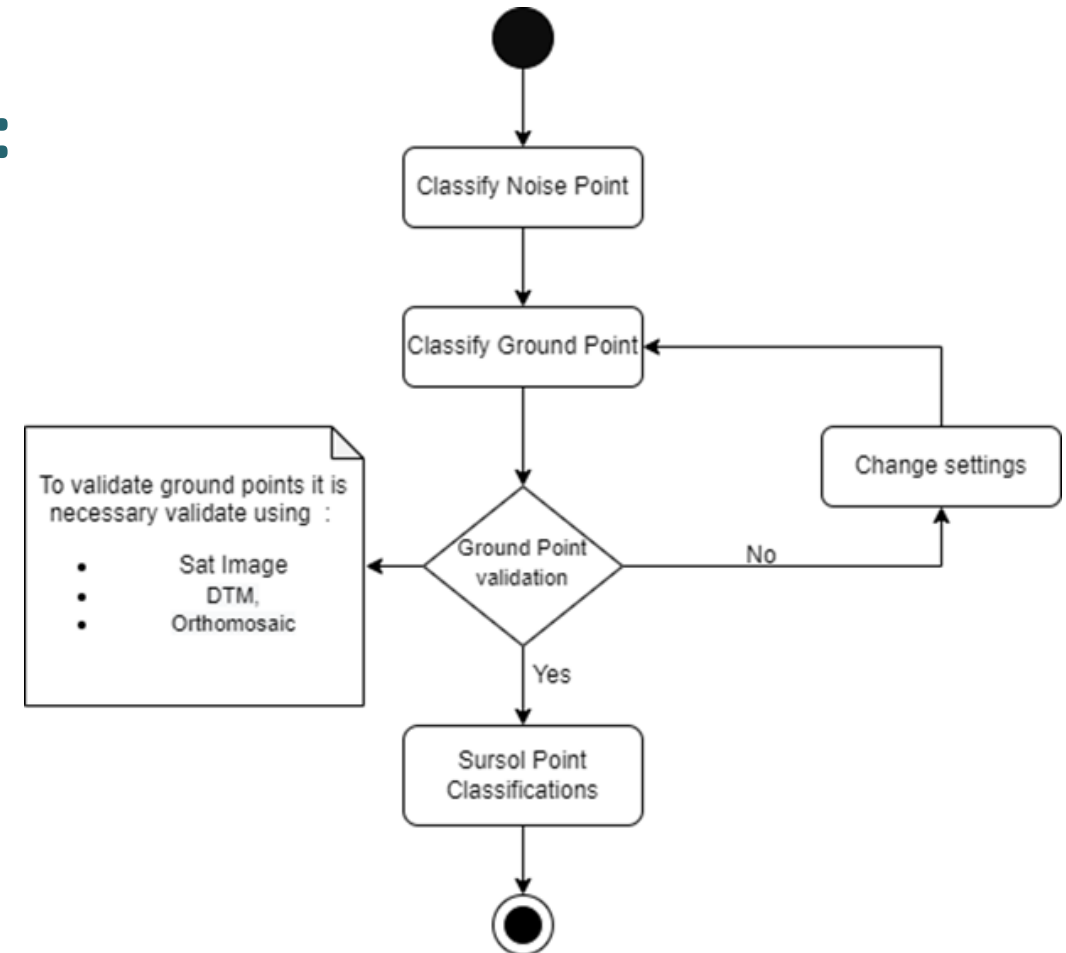
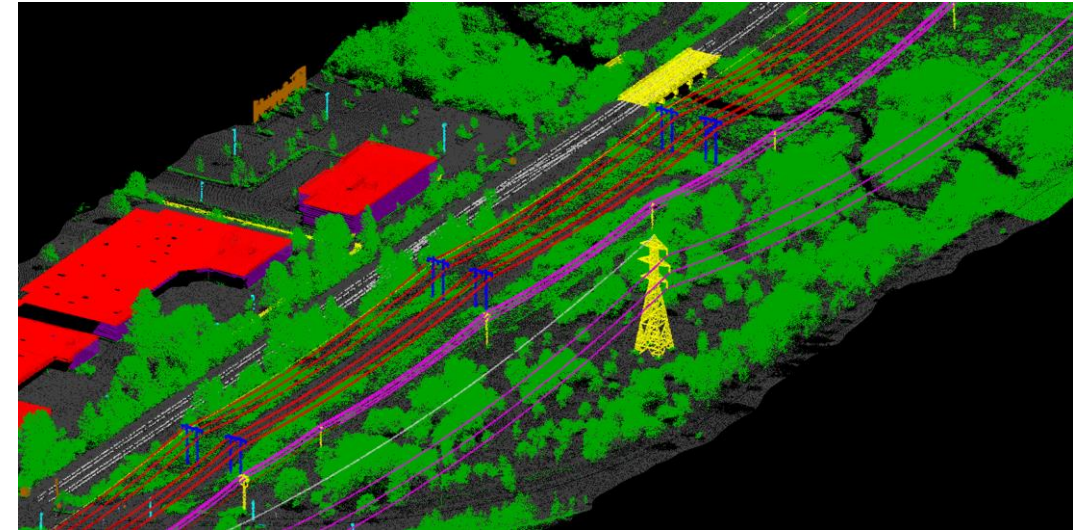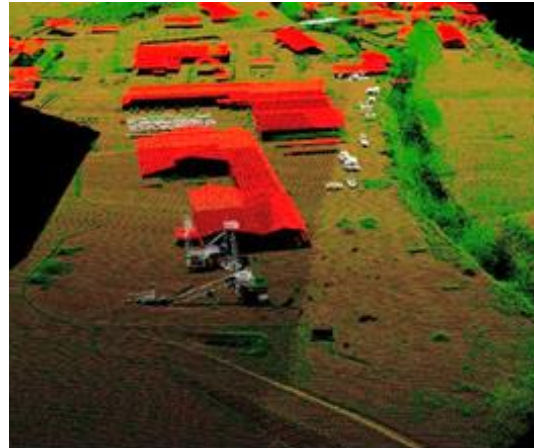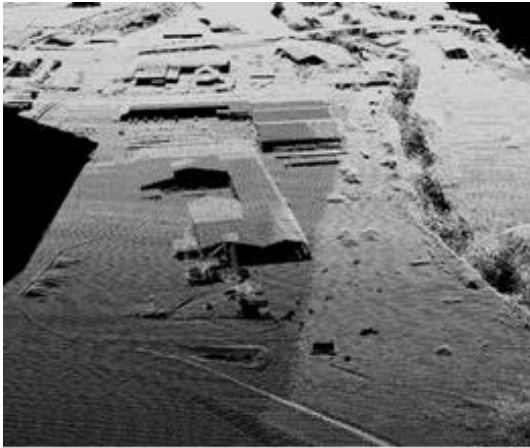- Routines
- Extraction of parameters
- Macros

Rural area

Mountainous area

Urban area

Quarry area

Power lines

FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting Our World, Conquering New Frontiers

- *General context*
- *Organization of the flight missions*
- **Classification of Lidar Point Cloud**
- *Exploitation of Lidar data*
- *Conclusion*

Classification of Lidar Point Cloud :

- Visualize in 3D the intense models, elevation model by color, model of colored points and representation of echoes to better understand the area and know the distribution of elements and details present in the area

- Calculate the necessary parameters for the routines: slope, building area, point density ...

- Create a processing macro to automate the process

- Manually reclassify the badly classified points

- *General context*
- *Organization of the flight missions*
- **Classification of Lidar Point Cloud**
- *Exploitation of Lidar data*
- *Conclusion*

Classification of Lidar Point Cloud :

FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting Our World, Conquering New Frontiers

- *General context*
- *Organization of the flight missions*
- *Classification of Lidar Point Cloud*
- **Exploitation of Lidar data**
- *Conclusion*

Exploitation of Lidar data :

- 3D cartographic product: DTM, DSM, contour line

- The generation of 3d vectors of constructions

- LIDAR data in several formats according to customer demand

- *General context*
- *Organization of the flight missions*
- *Classification of Lidar Point Cloud*
- *Exploitation of Lidar data*
- **Conclusion**
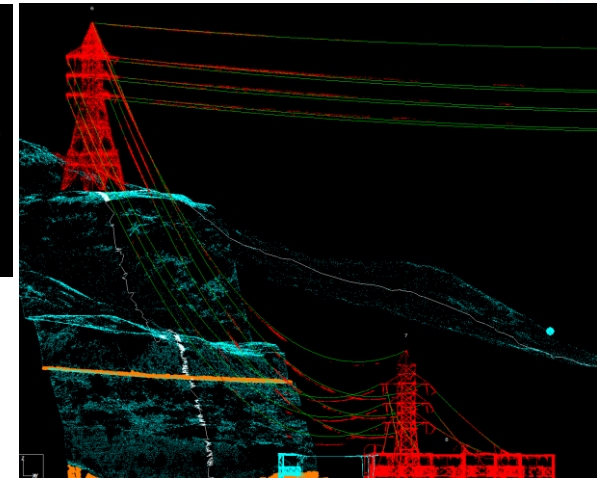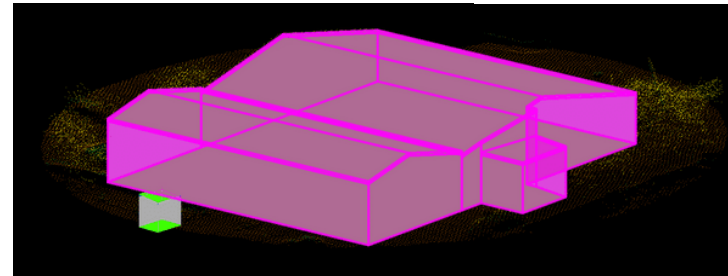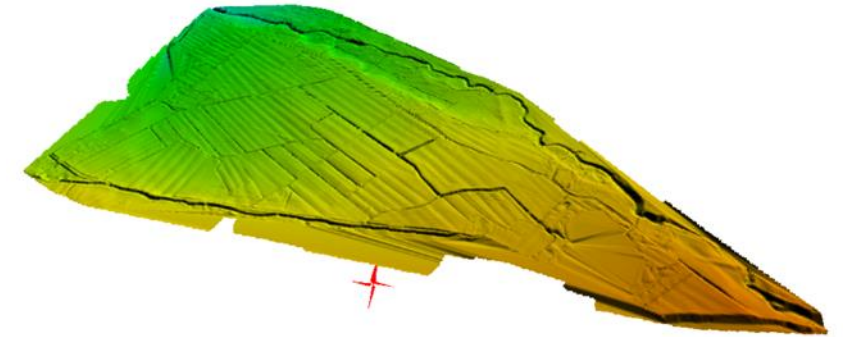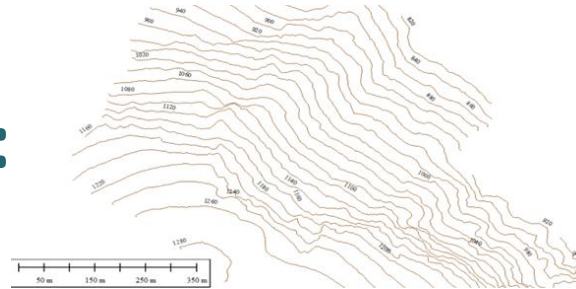
Conclusion

4 data processing and exploitation softwares
300 GB of LIDAR data processed
100% automatic classification in most projects
validation by field data

Ground classification optimization in urban areas
Analysis and studies: Hydrography, Agriculture, Geological Risks
Automatic 3D vector generation at large scales

THANK YOU FOR YOUR ATTENTION