



University of Žilina

***Faculty of Operation and Economics of Transport
and Communications***

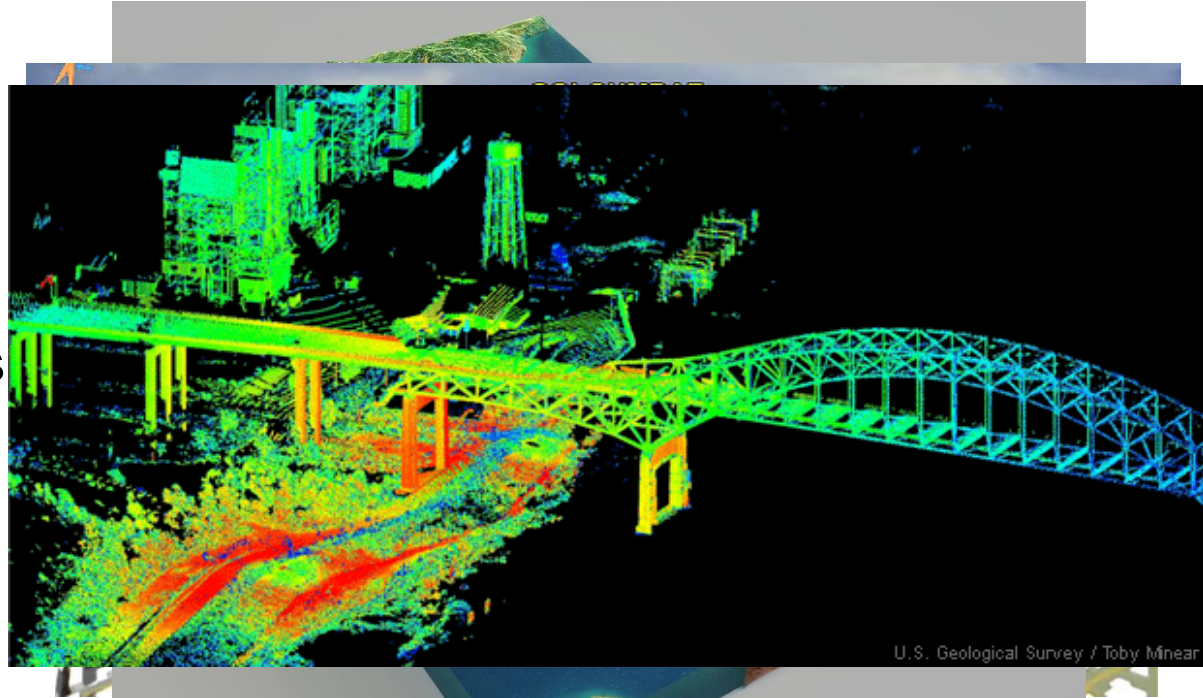
Air Transport Department

INAIR 2019, 12.-13.2018, Budapest

UAV usage in the process of creating 3D maps by RGB spectrum

Introduction

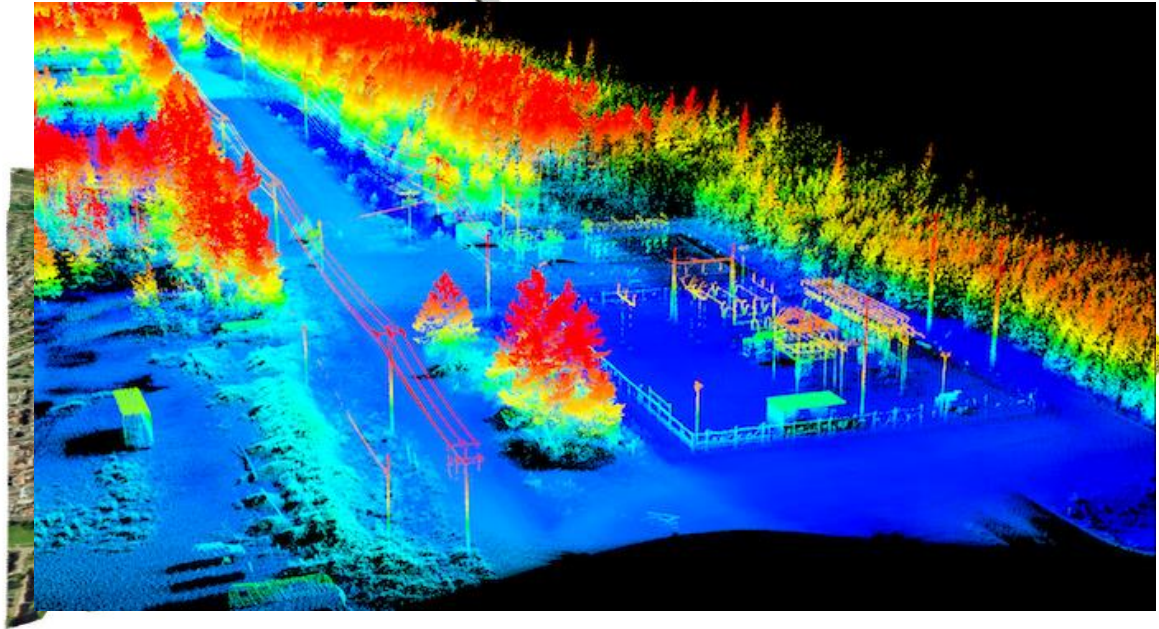
- Need of 3D maps creation for:
 - Civil engineering
 - Track natural changes
 - Cultural heritage
 - Educational needs
 - Research needs



Current status

Methods to create 3D maps:

- Photogrammetry
- Lidar scan
- Gravimetry



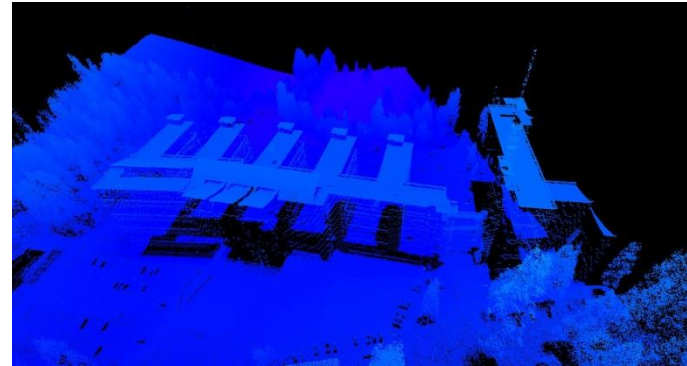
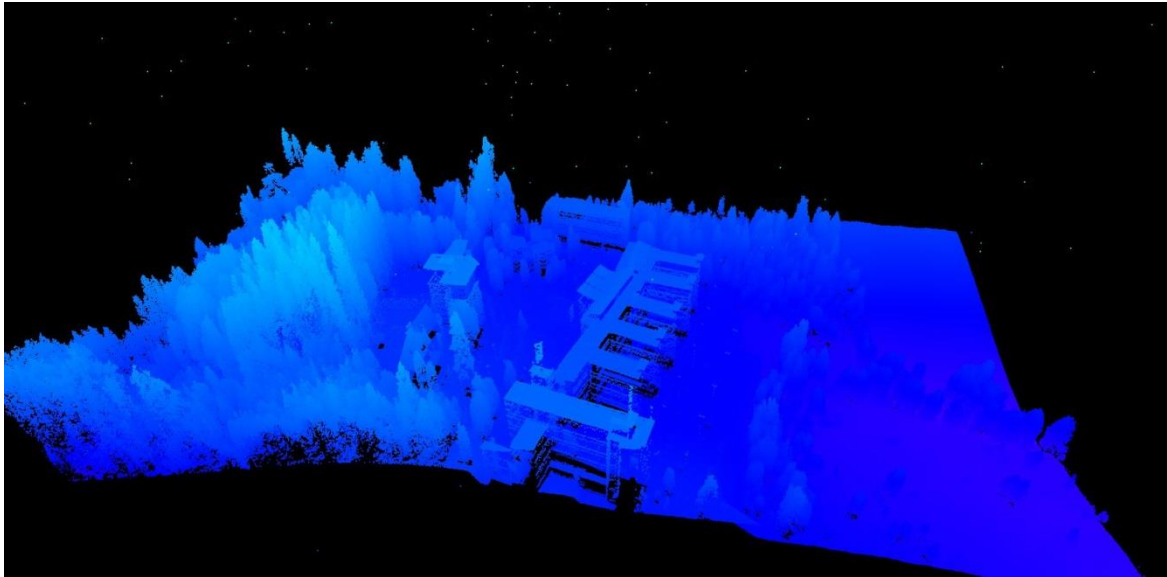
Methods of data acquisition



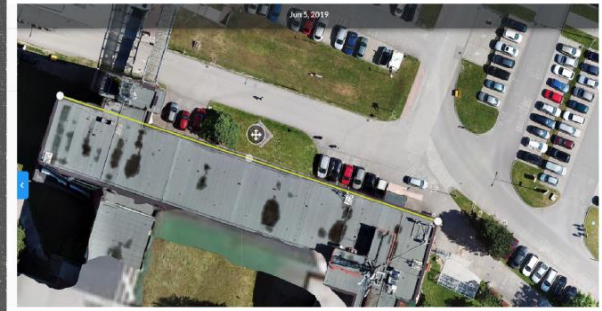
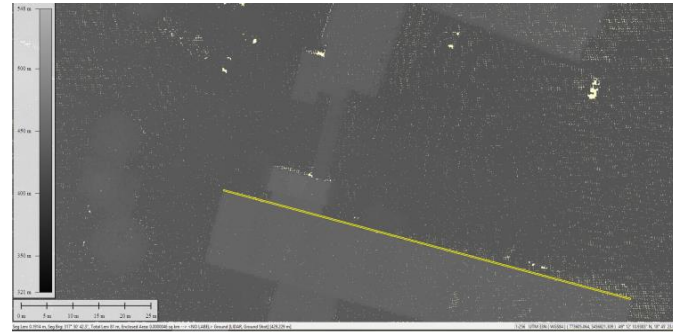
- Flight duration: 14 minutes
- Battery used: 1
- Number of pictures: 431
- Used commercial software
- Used drone: Mavic Pro
- Total costs: approx. 150€

Methods of data acquisition

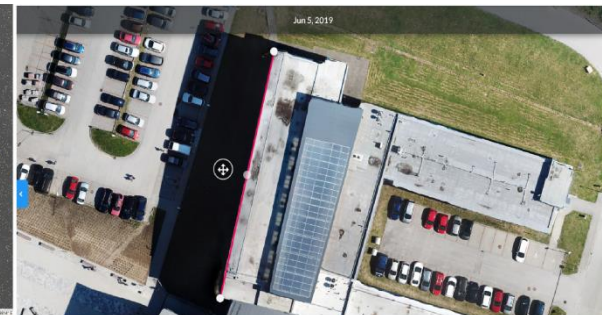
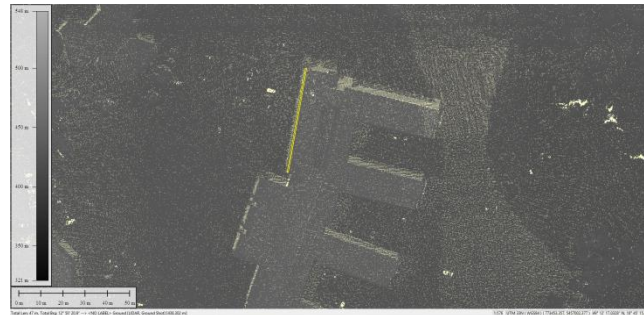
- Flight duration: approx. 60 minutes
- Airplane used: Piper Seneca 3
- Processing time: approx 12 hours
- Total costs: approx. 5000 €



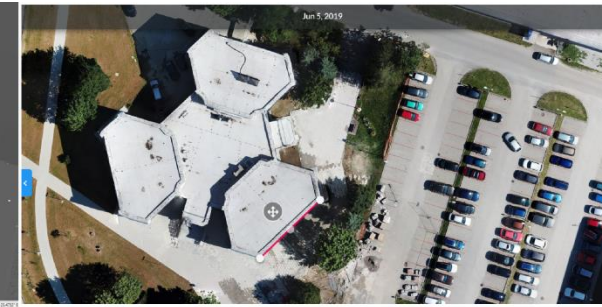
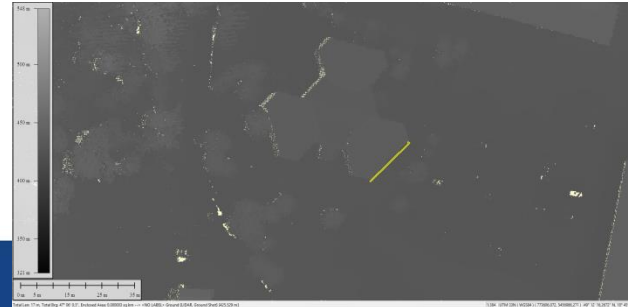
Results



	LIDAR lenght	RGB lenght
Figure 1	81m	80,36m
Figure 2	47m	47,53m
Figure 3	17m	16,20m



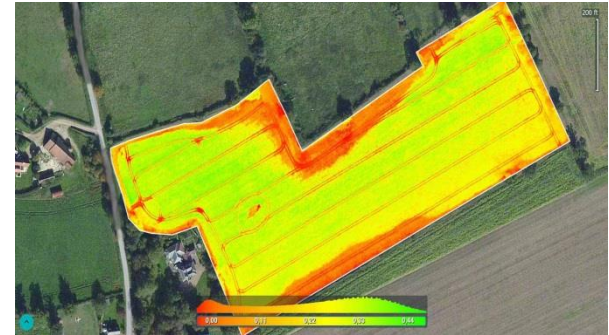
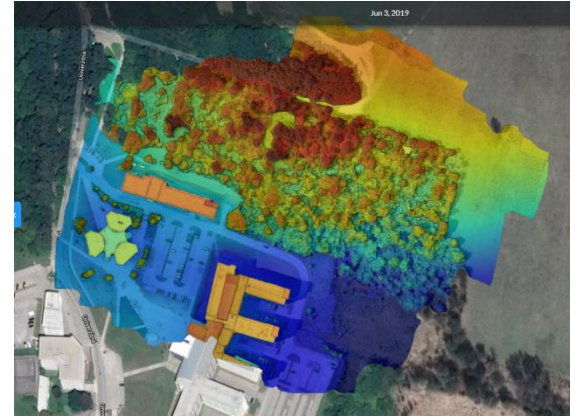
Difference was only 0.7% for a large objects and 4.7% for a small objects.



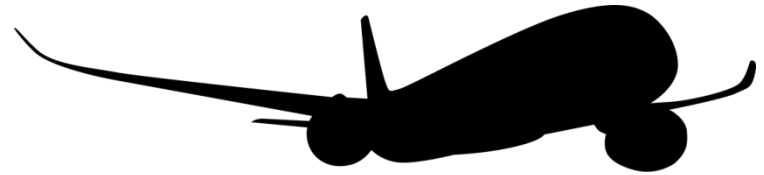
Conclusion

- RGB scan & 3D mapping is reliable tool
- Significant less costs than LiDAR (airplane)
- RGB scan can be used for more options (agriculture)
- The results are sufficient in terms of price
- Time of processing
- Repeated tests to track changes

- Accuracy
- Size of area
- Price
- UAV law and legislation



Thank you



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The article was created with the support of the science and research development of the “Nadácia Tatra banky”.

