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Automated Inspection within Galleries of Large Dams

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Structural Health Monitoring and Inspection



Sensors

1. DSLM camera *Lumix DMC-FZ2000*
Pixel size at 1 m : 0.3 mm/px



2. Mapping system *Leica BLK2Go*
Pixel size at 1 m : 1.6 mm/px



3. Depth camera *Helios Time of Flight 3D Camera*
Pixel size at 1 m : 1.7 mm/px



Results



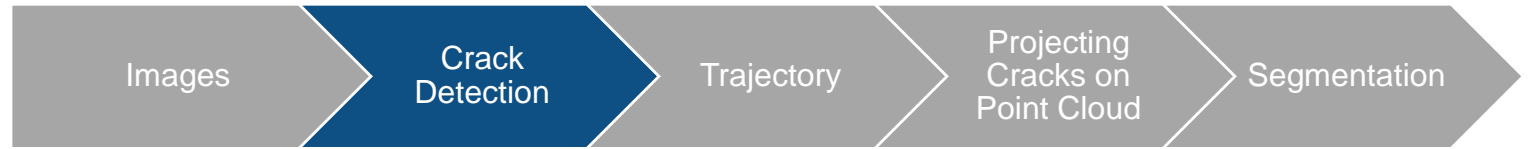
DSLIM



BLK2GO



Results



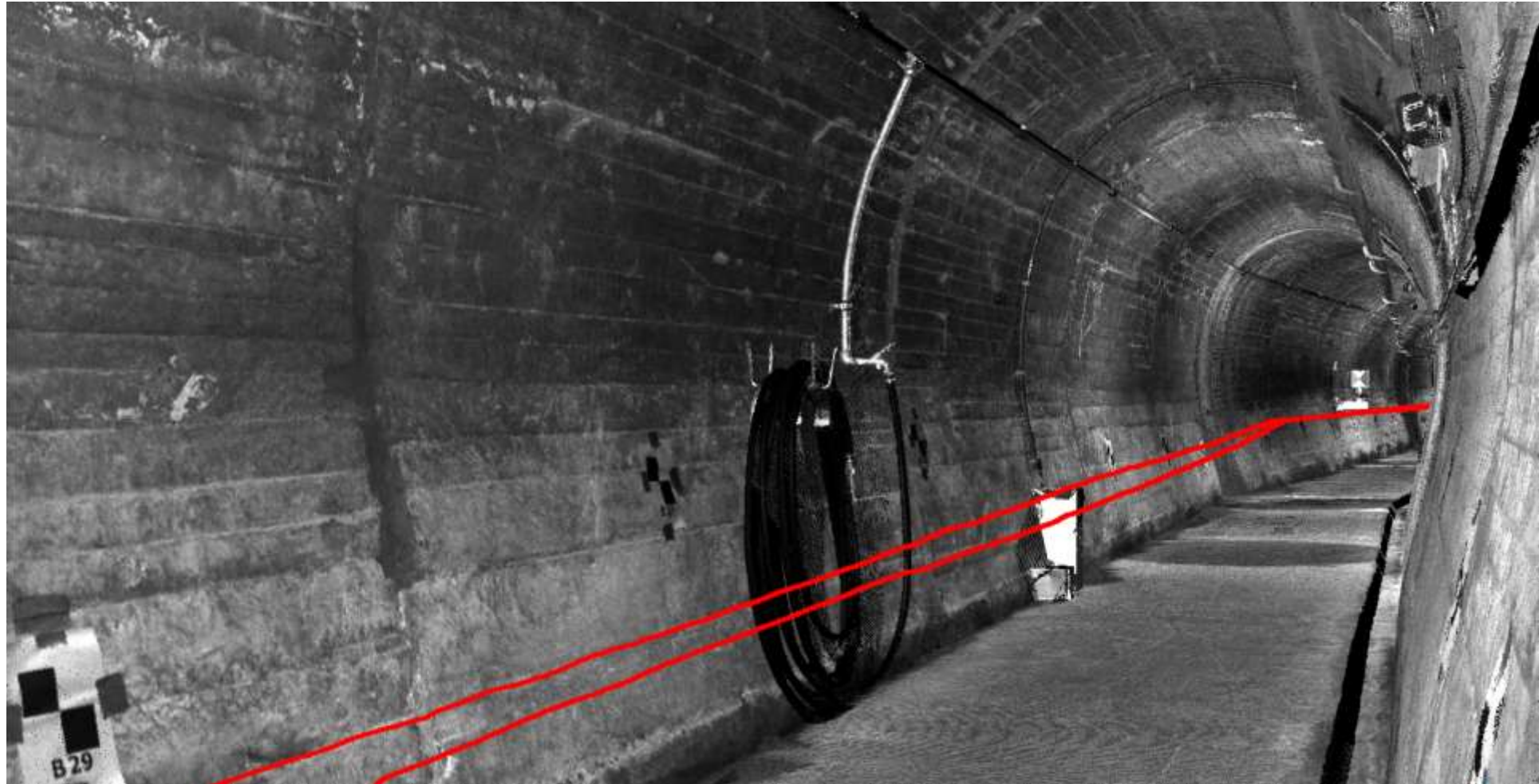
DSLIM



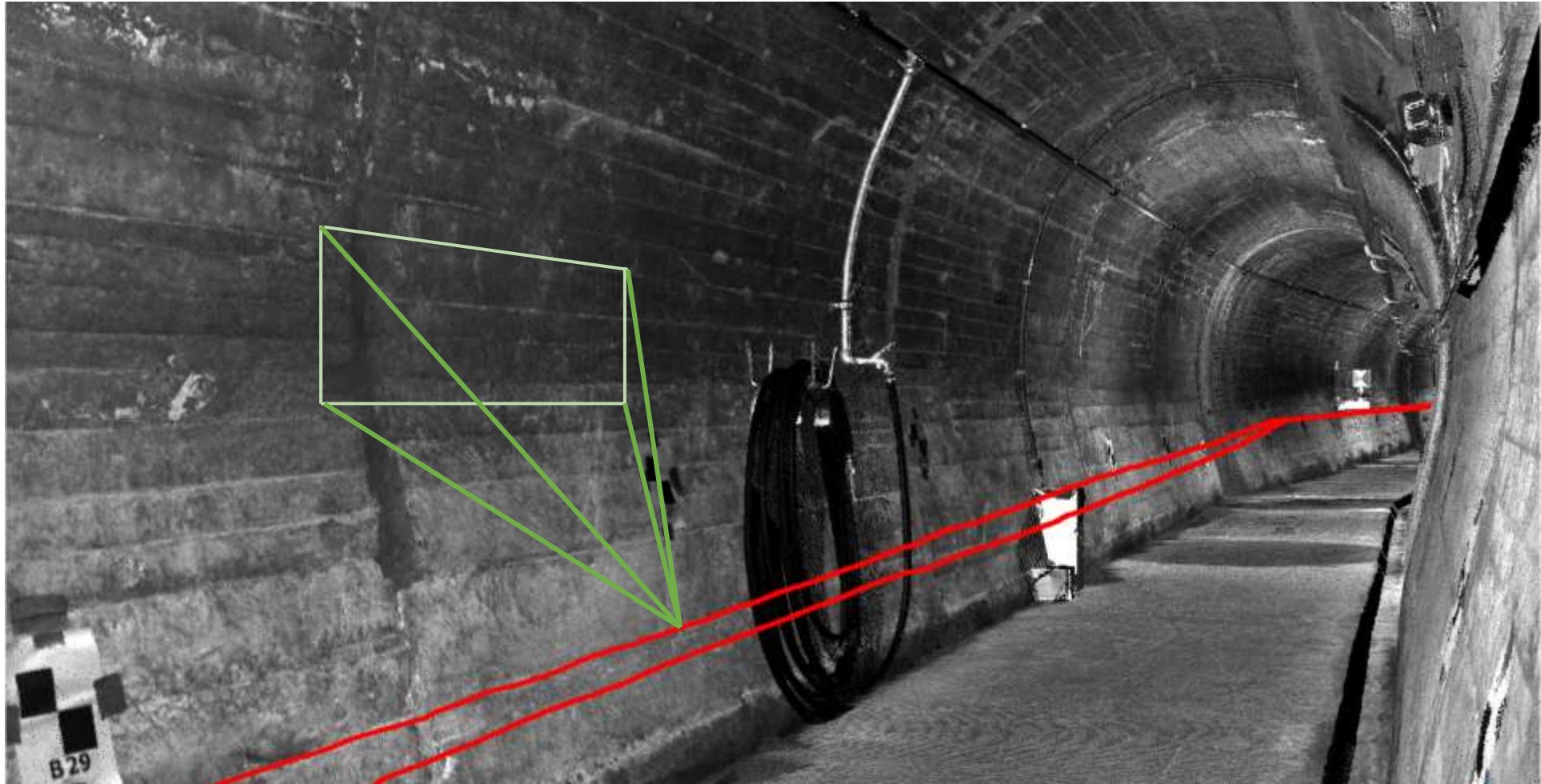
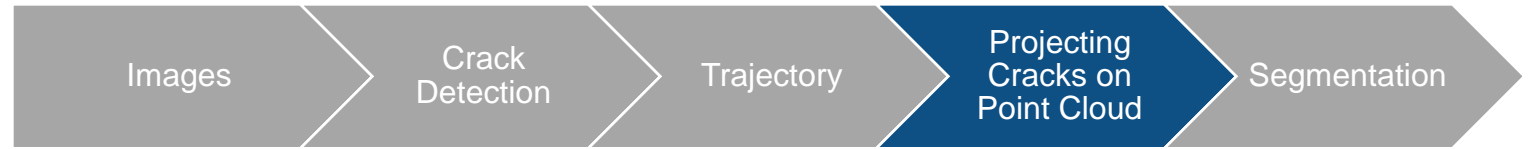
BLK2GO



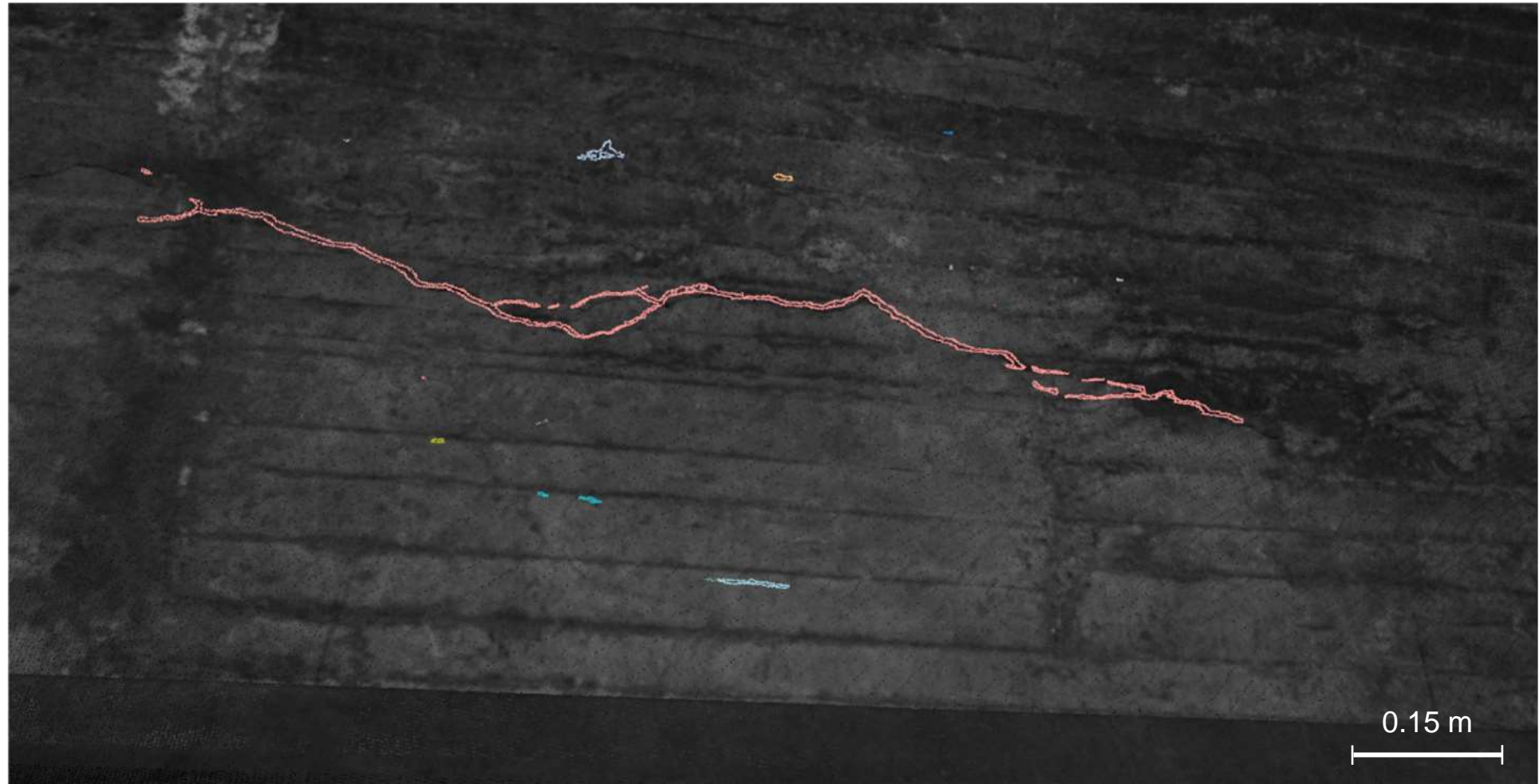
Results



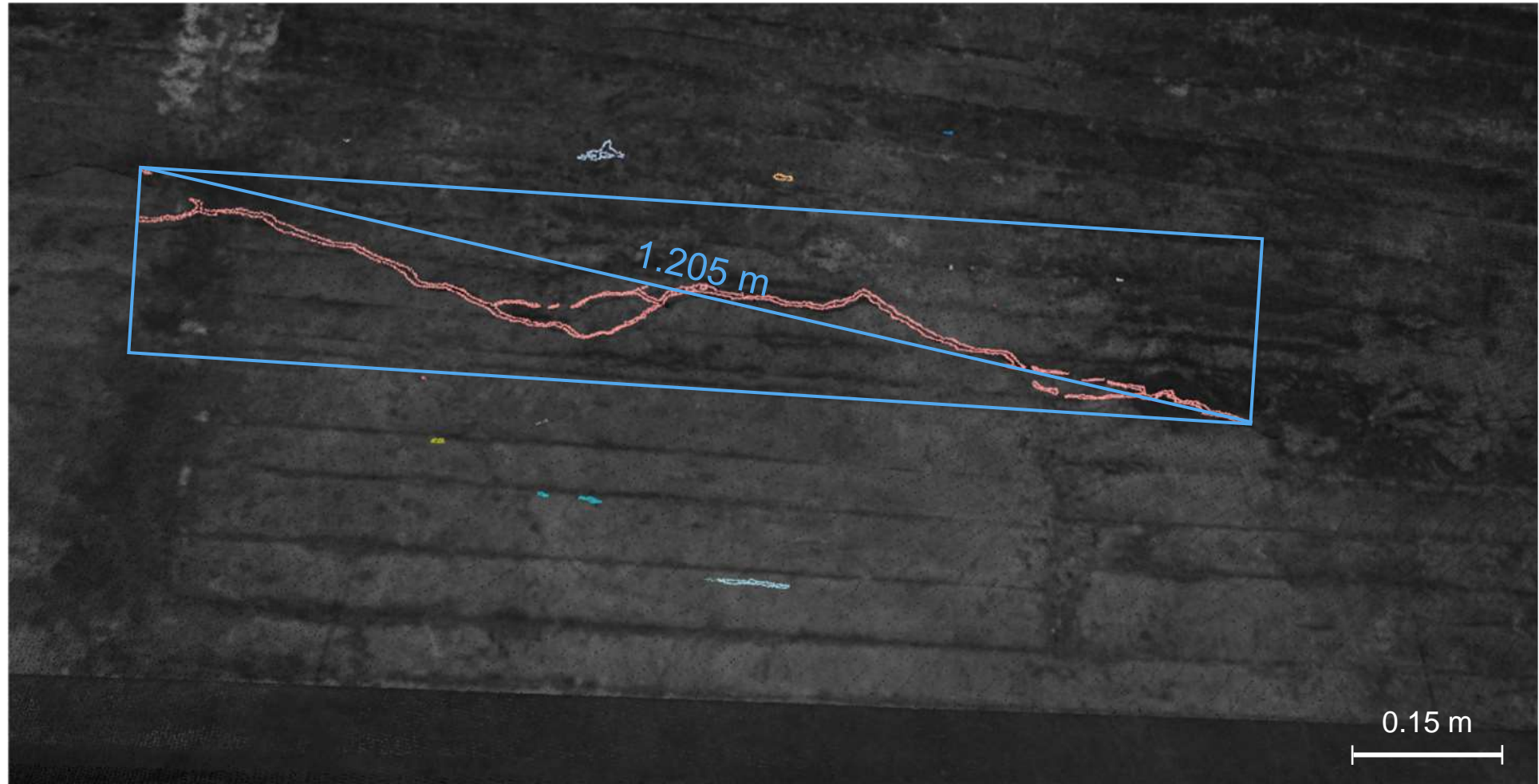
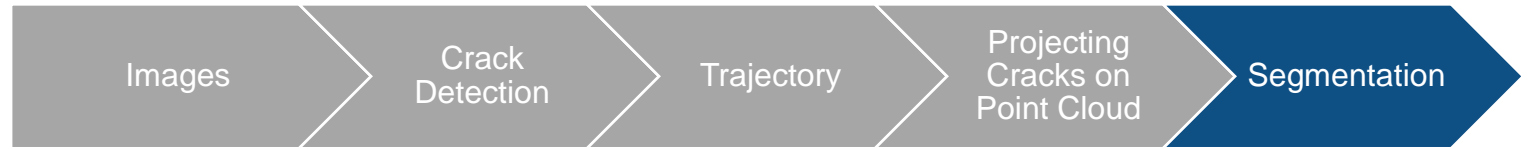
Results



Results



Results

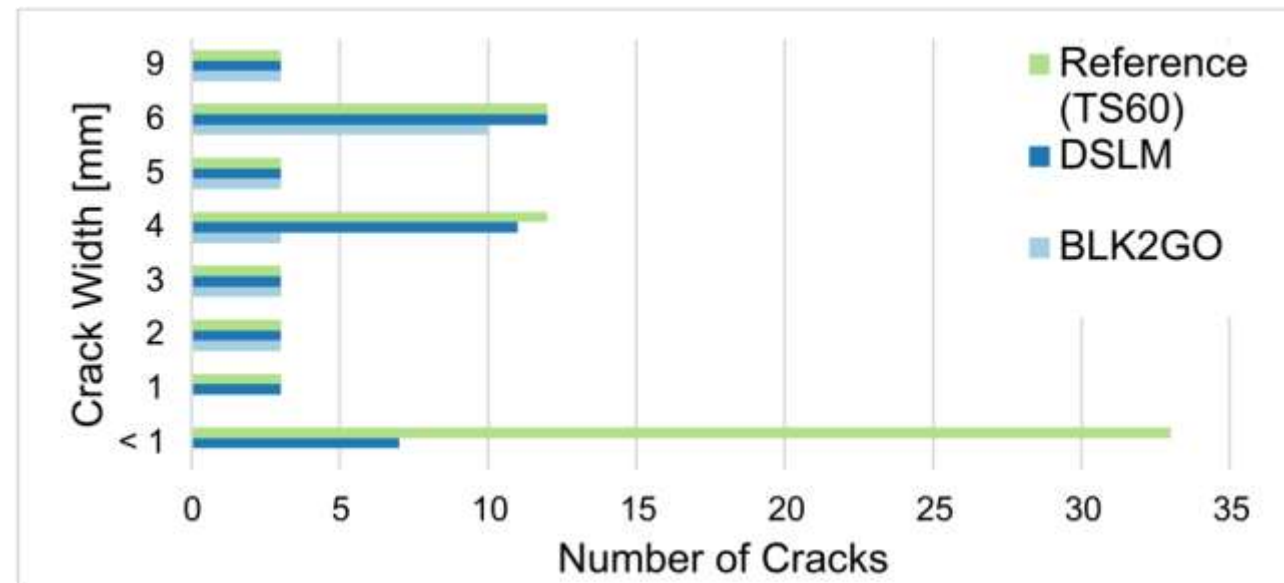


Results - Summary

	DSL	BLK2GO	Depth Camera
Image Localization	needs photogrammetric model, trajectory	trajectory with drift	needs photogrammetric model, trajectory
False-Negative (crack not detected)	~ 30 %	~ 60 %	-
Minimal Detectable Crack Width	> 1 mm	> 2 mm	> 6 mm (no thinner cracks on analyzed pictures)

Conclusion

- Detecting cracks on DSLM images larger than 1 mm is possible with a prediction accuracy of around 70 %
- DSLM is still most suitable for this application regarding prediction accuracy
- Future system configuration with UAV, 360° camera and fixed light



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Results Depth Camera

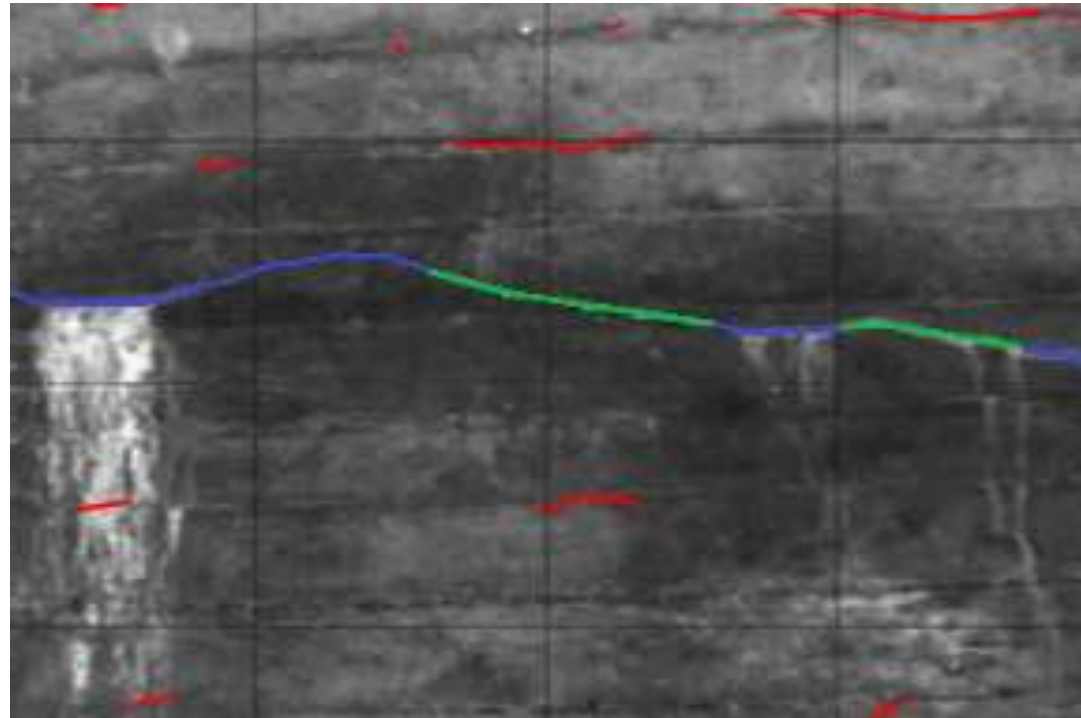


Figure 9: Cracks on the intensity image of the depth camera (green: correct detected, blue: false-negative values, red: false-positive values)