

New Perception Approaches for Mobile Robots in Low Visibility Environments

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Overview

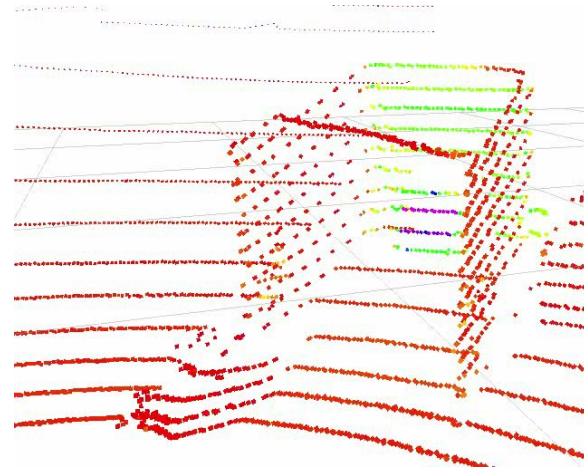
1. Low visibility: Where it occurs, where the problems are and what our goal is.
2. Thermal imaging: Handling thermal reflections and mapping on 3D structure.
3. Radar versus LiDAR. How to combine radar and LiDAR in an optimal manner.



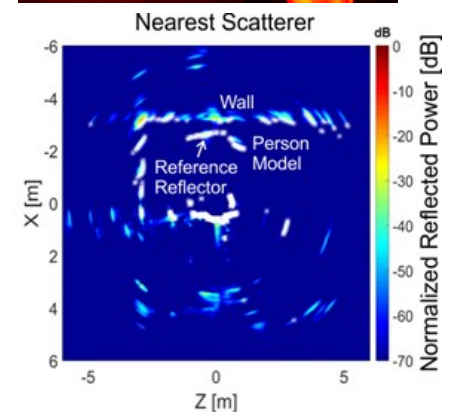
Source:

https://c1.staticflickr.com/9/8538/8696786470_a59af959a0_b.jpg

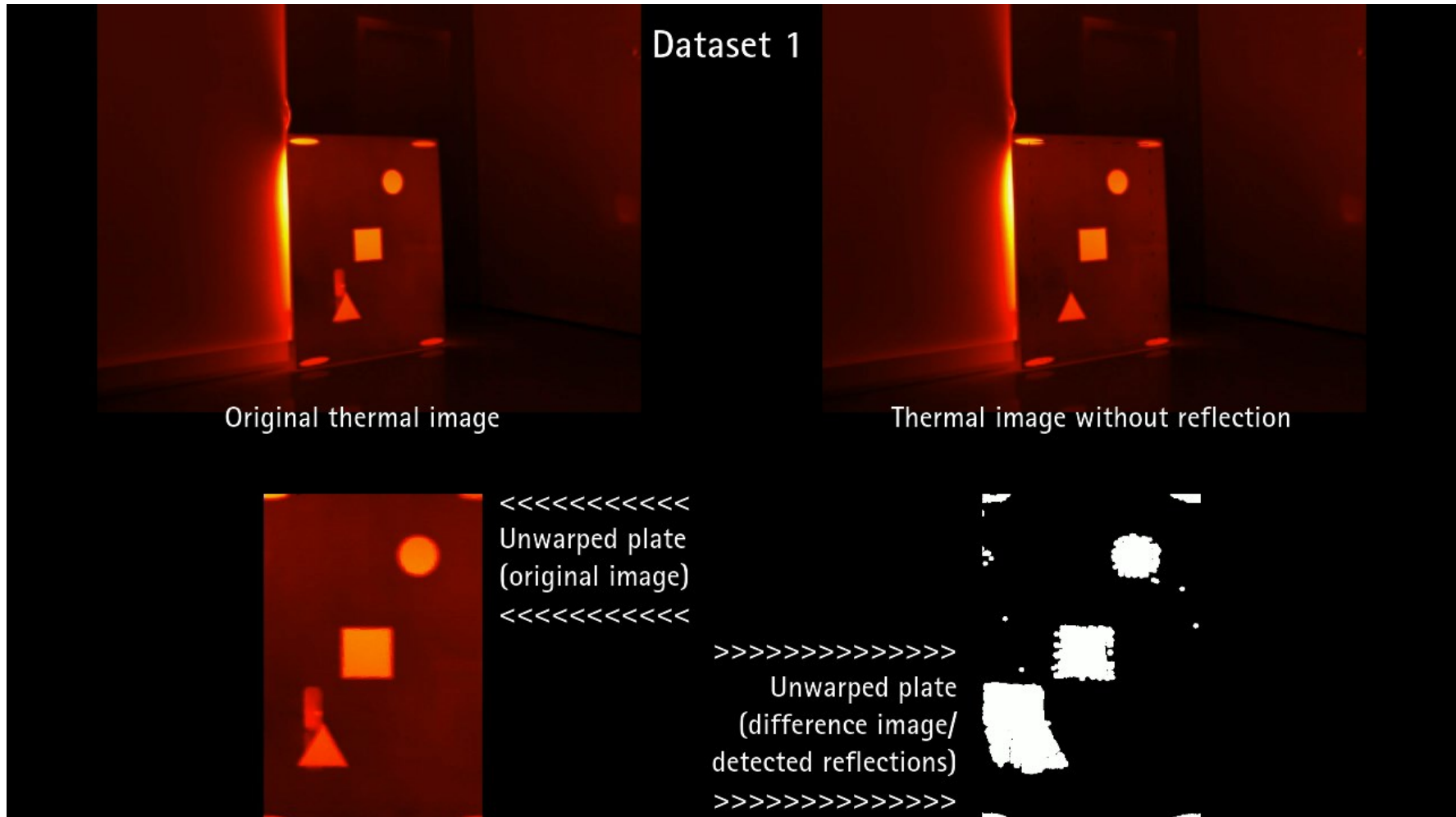
1. Low Visibility: Where are the Problems?



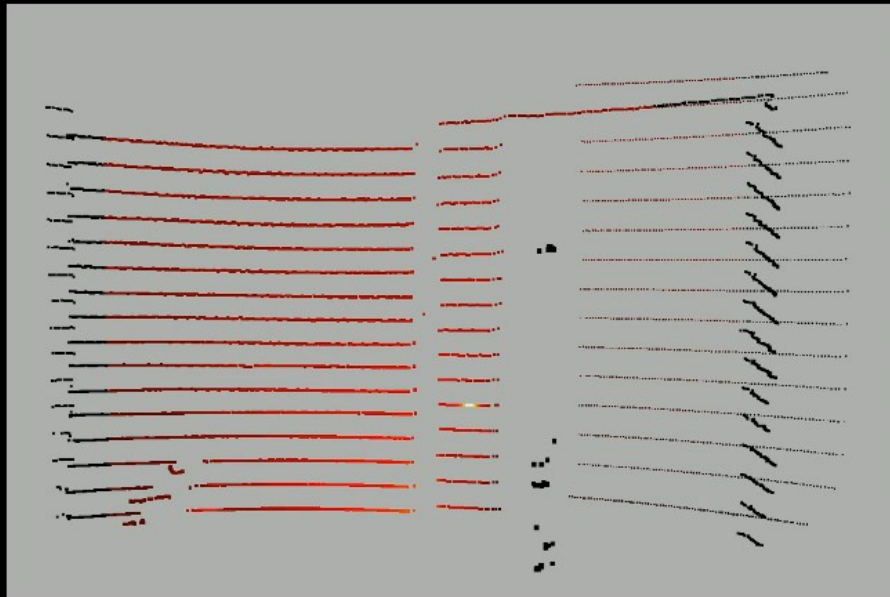
- RGB cameras and LiDAR scanner cannot see through dense fog or smoke.
- Thermal reflections
- Radar's resolution is lower than that of LiDAR



2. Handling Thermal Reflections



2. Thermal Mapping onto 3D Structure



Pointcloud with mapped temperatures



False-colored thermal image

3. Radar and LiDAR Scan Fusion



Acknowledgment

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Thank you for your Attention!