Docket #: S20-531

Resonant Scanning Design and Control for Fast Spatial Sampling

Despite their compact form factor and low power consumption, resonant scanners have not been widely applied to LiDAR due to their scanning trajectory. Here, Stanford researchers have developed a design rule for balancing sample efficiency and sampling range to obtain optimized scanning patterns. Recent studies have shown that focusing on Regions-of-Interest (RoI) with resonant scanning help meet necessary data processing requirements. This system allows for defined RoIs while using both single and multiple frequency scanning patterns and wide-band phase control to acquire the necessary data. Combined, this leads to a more efficient spatial information sampling with high frame rates of ~100 Hz, making it ideal for LiDAR and other 3D computer vision applications including robotics, navigation and augmented reality.

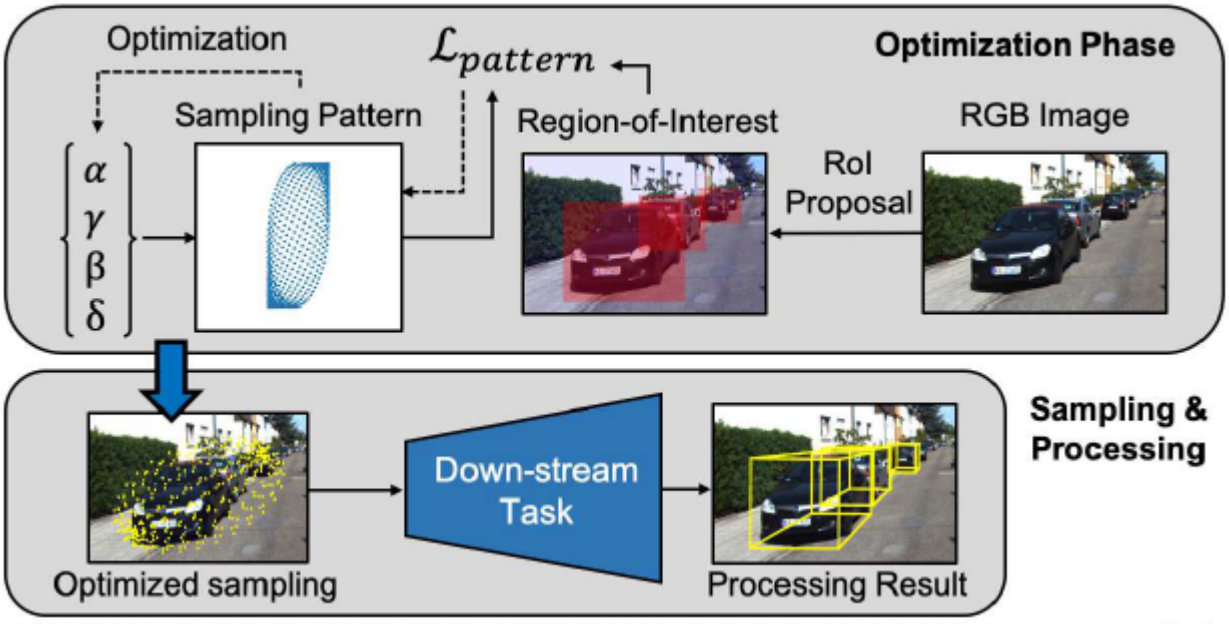

Photo description: Schematic pipeline of the optimization framework using 3D object detection as an example target task. Credit: Sun et al. arXiv (2021).

Stage of Research

- Prototype

Applications

- LiDAR systems, especially in mobile devices such as robotics, navigation, and AR/VR glasses
- 3D imaging modules

Advantages

- Better form factor, field-of-view, and power consumption vs. raster scanners
- Adaptive regions-of-interest sampling
- Multi-frequency scanning control

Publications

- Sun, Zhanghao, Ronald Quan, and Olav Solgaard. Resonant Scanning Design and Control for Fast Spatial Sampling. arXiv preprint arXiv:2103.12996 (2021).

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