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Robust statistical approaches for circle fitting in laser scanning three-dimensional point cloud data

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Highlights:

- **Two robust circle fitting algorithms are proposed in point cloud data.**
- **The new methods fit robust circle in the presence noise, and high percentage of scattered and clustered outliers.**
- **The proposed methods fit and reconstruct circles for partial as well as full arc data.**
- **They are more accurate and robust than existing robust statistical methods like LTS and LMS, pattern recognition technique: LTSD, and computer vision techniques like RANSAC.**
- **The algorithms potential include building information modeling, product quality control, arboreal assessment and road asset monitoring.**

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