In terms of existing research, there is quite a bit of existing studies regarding detecting boundaries for objects which can be directly applied to pothole detection. Similarly, the technologies used to capture data has expanded past just 2d imaging to include 3d image mapping as well to include depth as a feature. If I were collecting and cleaning my own data it might be possible to incorporate this past research into the data collection process by adding additional input sensors; however since I decided to go with an existing dataset, such improvements are not feasible to implement.

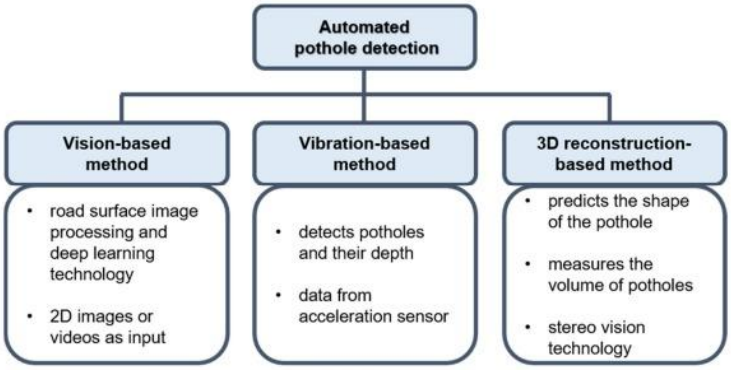

Figure 2. The characteristics of automated pothole-detection methods.

Table 1. The strengths and weaknesses of automated pothole-detection methods.

Methods	Strengths	Weaknesses
Vision-based method	• It is more cost-effective than the 3D reconstruction-based method • It is suitable for determining the number and approximate shape of potholes	• It has limitations in measuring information such as volume and depth of potholes • It is affected by lighting and shadow condition
Vibration-based method	• It is the most cost-effective among the three methods • It requires small storage • Real-time data processing can be applied	• It has limitations in providing the exact shape of potholes • It is affected by the sensor and vehicle applied in the data-acquisition process
3D reconstruction-based method	• It measures the shape of potholes most accurately among the three methods	• It is the most expensive among the three methods

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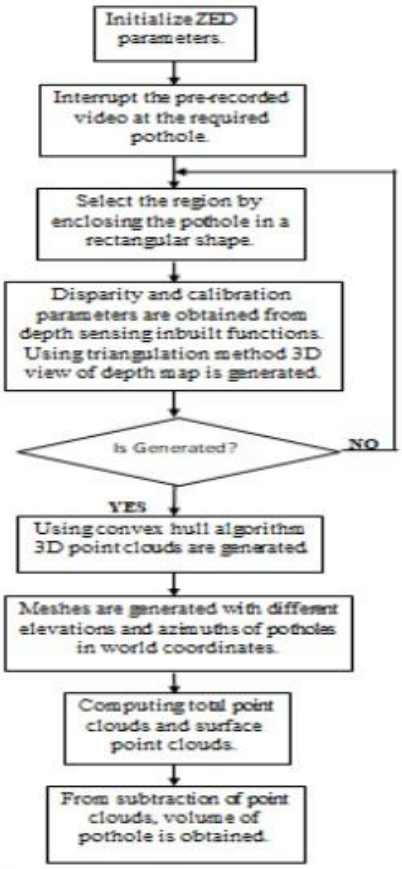
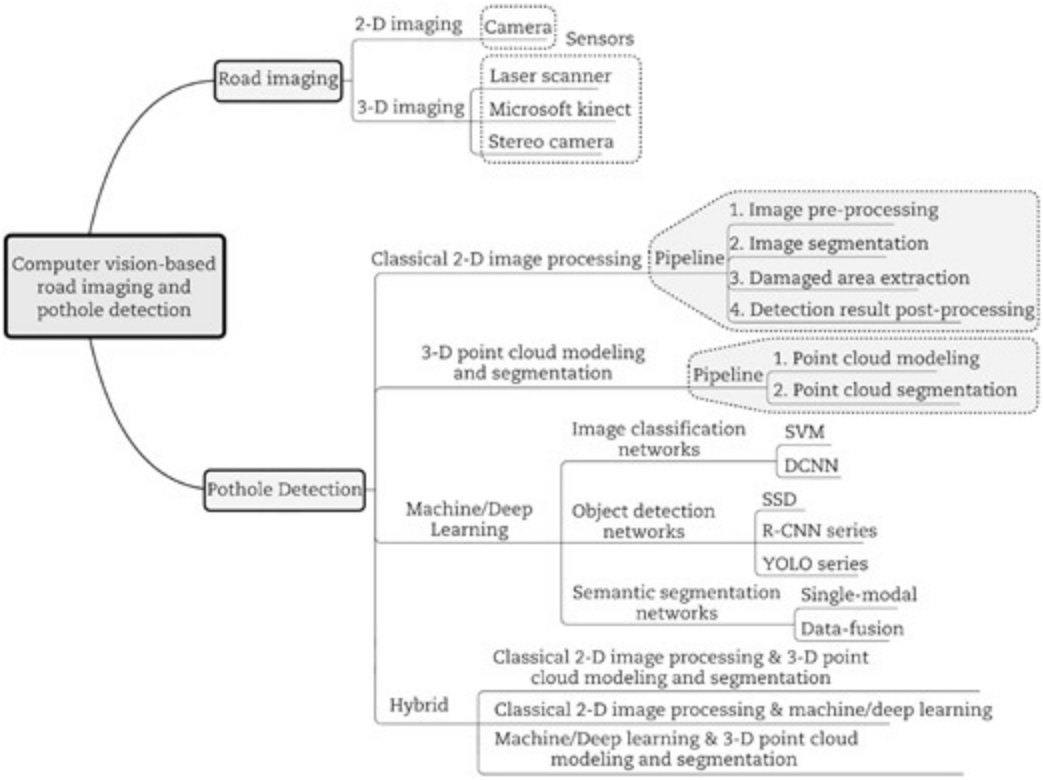


Fig. 3: Proposed methodology for reconstruction of a pothole.



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- https://arxiv.org/pdf/2012.10802.pdf