Object Position and Orientation Detection For Mars Science Laboratory Helicopter Test Imagery

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The Mars Science Laboratory landing radar underwent testing where the radar was attached to a helicopter with a rover mockup suspended underneath. The rover mockups position was varied while the radar was operating in order to test how the position of the rover affects the radar return. Knowledge of the rover mockup position at each time instant is crucial in determining what effects may be present.

A camera pointing down underneath the helicopter took pictures every half second. It is proposed to use these images, along with the targets placed on the rover deck, to determine the rover's position and orientation in each image. Being that the targets are circular, it is proposed to use Hough Transform methods to identify the targets, then use the various properties of each detected circle to match them with the known circle positions relative to each other. Once these are known, the position and orientation can be deduced.

REFERENCES

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