



# NAVAL RESEARCH LABORATORY

## TECHNOLOGY LICENSING OPPORTUNITY

### MACHINE VISION SYSTEM

#### Advantages/Features

- Able to differentiate parts in cluttered environments
- Applicable to nearly any surface shape
- Extremely accurate recognition
- Easily trained from a range image or computer model
- Completely invariant to viewpoint
- High speed (milliseconds)
- Insensitive to variation in lighting

#### Applications

- Range-based target recognition
- Industrial parts recognition for automated manufacture and assembly
- Face recognition
- Mobile robot vision
- Unexploded ordnance identification

#### For more information contact:

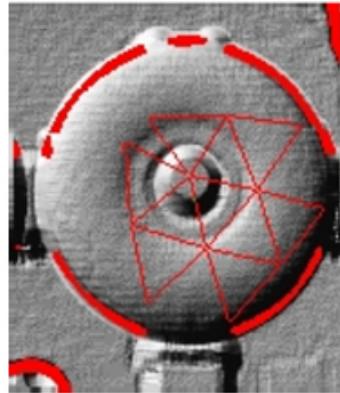
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#### Identification Number:

AI02



*Tripod operator finds a torque converter using a LIDAR Image*



*Unattended robot automatically locates and precisely places a torque converter*

The Naval Research Laboratory (NRL) has developed a method for the rapid recognition and location of surface shapes in range images. This method can be used for face recognition, munitions identification, and to train robots to see. Unlike other image-based methods, the NRL approach is completely insensitive to variation in lighting or viewpoint and is extremely time-efficient. The patented NRL technique uses tripod operators, which extract sample points from a range image in order to recognize the underlying surface shape. Coupled with a suitable range imaging scanner, such as the patented NRL Correlation Scanner, this technique enables the automation of many tasks previously relegated to human labor. The system has been demonstrated for use in automated assembly for manufacturing and in support of spacecraft docking maneuvers.

#### References

Rapid Recognition of Elementary Surface Shapes in Cluttered Range Images Using Tripod Operators. Proceedings of the Workshop on Machine Vision Applications, International Association for Pattern Recognition, Kawasaki, Japan, 1994.

A Structured Light Range Imaging System Using a Moving Correlation Code. 3rd 3-Dimensional Data Processing, Visualization, and Transmission (3DPVT) Workshop, Chapel Hill, NC (2006) 931-937.

**Available for License: 6,393,143 and other applications have been filed.**

