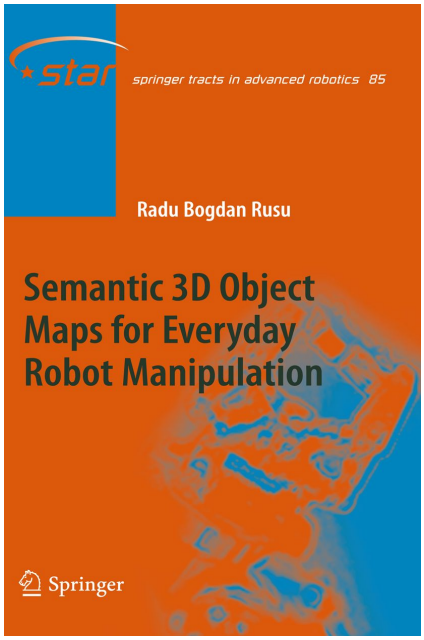

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R.B. **Rusu**

Semantic 3D Object Maps for Everyday Robot Manipulation

Series: Springer Tracts in Advanced Robotics, Vol. 85

- **Recent research on Semantic 3D Object Models as a novel representation of the robot's operating environment**
- **Applies Semantic 3D Object Mapping to Everyday Manipulation in Human Living Environments**
- **Displays how these models can be automatically acquired from dense 3D range data**

The book written by Dr. Radu B. Rusu presents a detailed description of 3D Semantic Mapping in the context of mobile robot manipulation. As autonomous robotic platforms get more sophisticated manipulation capabilities, they also need more expressive and comprehensive environment models that include the objects present in the world, together with their position, form, and other semantic aspects, as well as interpretations of these objects with respect to the robot tasks.

The book proposes novel 3D feature representations called Point Feature Histograms (PFH), as well as frameworks for the acquisition and processing of Semantic 3D Object Maps with contributions to robust registration, fast segmentation into regions, and reliable object detection, categorization, and reconstruction. These contributions have been fully implemented and empirically evaluated on different robotic systems, and have been the original kernel to the widely successful open-source project the Point Cloud Library (PCL) -- see http://pointclouds.org.