

# Deep Learning for Computer Vision: Challenges and Successful Applications in Manufacturing and Robotics

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**Abstract:** Deep learning models, especially deep convolutional neural networks, have become extremely popular in the computer vision community over the past few years. This popularity has led to a plethora of learning architectures and algorithms that have been particularly successful in image classification and object recognition problems. In this talk, I will discuss the challenges and methods to overcome them for two relatively unexplored applications: automated inspection of assembled parts with varying geometries and illumination conditions, and online perception of human actions during indoor object manipulation. I will conclude by pointing out several future research directions.

**Bio:** Ashis G. Banerjee is an Assistant Professor with joint appointment in the Department of Industrial & Systems Engineering and the Department of Mechanical Engineering at the University of Washington, Seattle. Prior to his current appointment, he was a Research Scientist at General Electric Global Research. Before that, he was a Research Scientist and Postdoctoral Associate at the Massachusetts Institute of Technology. He obtained his Ph.D. and M.S. in Mechanical Engineering from the University of Maryland, College Park, and B.Tech. in Manufacturing Science and Engineering from the Indian Institute of Technology, Kharagpur. Dr. Banerjee has received several honors including the 2018 Top Engineer of the Year Award from the International Association of Top Professionals, the 2012 Most Cited Paper Award from the Computer-Aided Design journal, the 2009 Best Dissertation Award from the Department of Mechanical Engineering, and the 2009 George Harhalakis Outstanding Systems Engineering Graduate Student Award from the Institute for Systems Research at the University of Maryland. His research interests include digital manufacturing, predictive and prescriptive analytics, and autonomous robotics.