

Marianna Madry-Pronobis  
CVAP/CAS Lab, KTH

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# Object Categorization

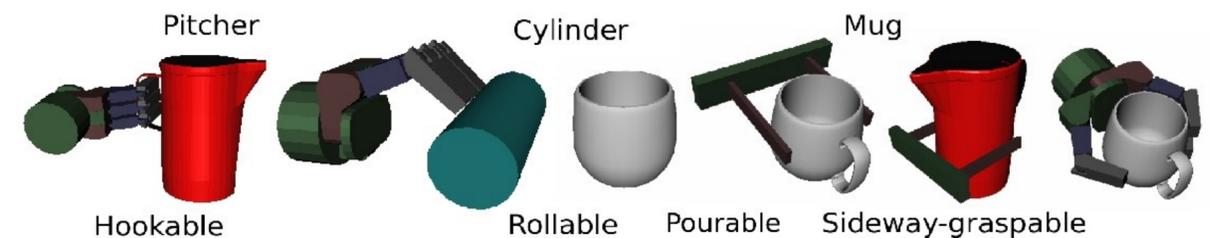
- Task:



- Motivation:

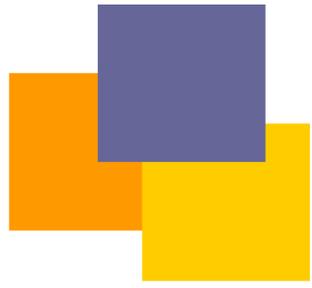
- \_ Object categorization is a key capability for a robot platform
- \_ Possible applications: semantic information, scene reconstruction, grasp planning

- Challenges:



- Goal – Object Categorization System:

- Robust to changes to in a viewpoint, scale, environment conditions
- Working in real time



# Problem Statement

## 2D Object Categorization System

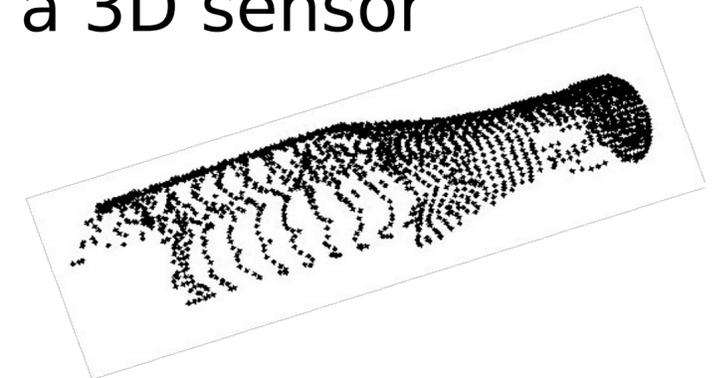
- Household objects, basic “linguistic” categories (cup, bottle, etc.)

- Input:

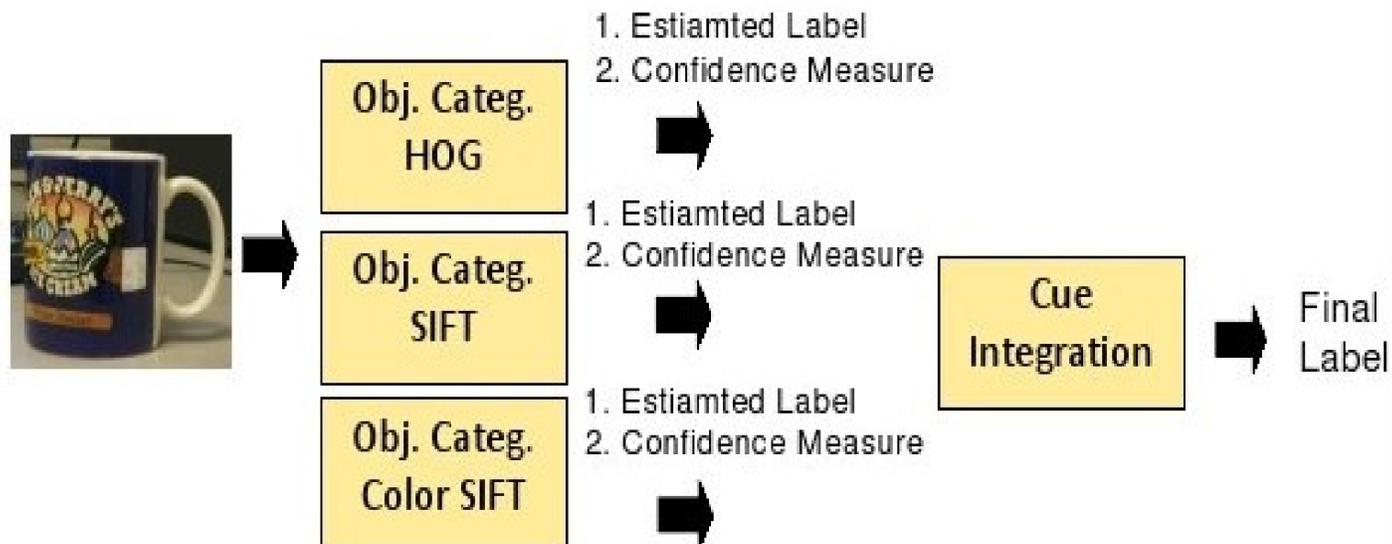
- Single object view (2D information)



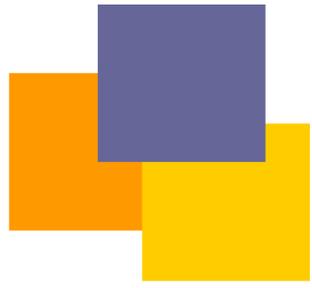
- Multiple views or a 3D sensor (3D information)



- Main focus: object representation
- 2D Object Categorization System

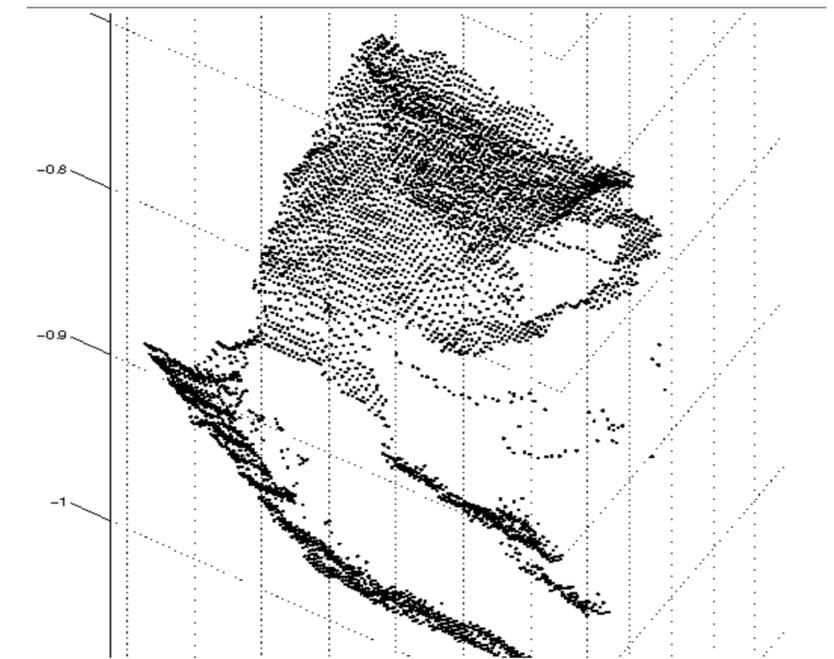
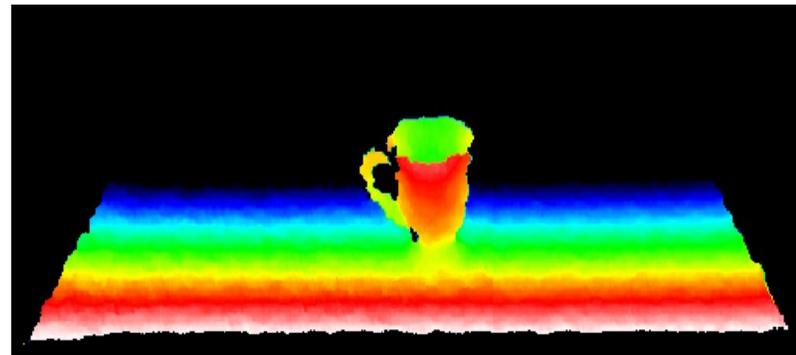


- + Vastly researched in recent years
- Sensitive to a viewpoint changes
- Input data affected by projective transformation
- Does not provide 3D information about environment



# 3D Object Categorization System

- Objects are in 3D! Use of 3D information:
  - 3D sensors became better and cheaper (**Kinect** sensors)



- Problems:
  - 3D data: **partial views**, noisy, incomplete
  - 2D solutions ~~→~~ 3D
  - 3D object models from object retrieval and computer graphics can not be directly applied
- 3D Object Categorization System

