





Experience Replay















Problems						
 Non-markovian Multi-model behavior Output mixtures of Guassians Implicit density models Auto-regressive discretization 						
12						

Case studies

Vision-based multi-task manipulation for inexpensive robots using end-to-end demonstrate, Rouhollah Rahmatizadeh, Pooya Abolghasemi, Ladislau Bölöni, and Sergey Levine.

• <u>Video</u>

1	3
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Perception for Personal Robotics

- Object detection
- Semantic Segmentation
- Pose estimation
- Visual navigation





















Task	Output	Example	
Recognition	Probability of class $\ c$ given image $\ I: p(c I)$	→ Motorbike	
Detection image :	regressing bounding boxes $b_i = \{x, y, w, h\}$ and probability of class C given bounding box b_i and the $I p(c b_i, I)$		
Semantic Segmentation	Probability of class $C_{x,y}$ for pixel (x,y) of Image $I: p(c_{x,y} I)$		

























Problem: Ambiguities

Headlines:

- Enraged Cow Injures Farmer With Ax
- Hospitals Are Sued by 7 Foot Doctors
- Ban on Nude Dancing on Governor's Desk
- Iraqi Head Seeks Arms
- Local HS Dropouts Cut in Half
- Juvenile Court to Try Shooting Defendant
- Stolen Painting Found by Tree
- Kids Make Nutritious Snacks
- Why are these funny?





















The Problem with Dictionary Lookups					
顶部	/ top /roof/				
顶端	/summit/peak/ top /apex/				
顶头	/coming directly towards one/ top /end/				
盖	/lid/ top /cover/canopy/build/Gai/				
盖帽	/surpass/ top /				
极	/extremely/pole/utmost/ top /collect/receive/				
尖峰	/peak/ top /				
面	/fade/side/surface/aspect/ top /face/flour/				
摘心	/ top /topping/				
	Example from Douglas Hofstadter				



Learning to Translate

				CLASSIC SOUPS Sm.	Lg.
方	燉雞	1	57.	House Chicken Soup (Chicken, Celery,	
				Potato, Onion, Carrot)1.50	2.75
雞	飯	*	58.	Chicken Rice Soup 1.85	3.25
雞	麵	*	59.	Chicken Noodle Soup1.85	3.25
廣	東(雲)	各	60.	Cantonese(Wonton)Soup1.50	2.75
퐇	茄蛋	**	61.	Tomato Clear Egg Drop Soup1.65	2.95
雪	呑	湯	62.	Regular Wonton Soup 1.10	2.10
酸	辣	*	63.	• Hot & Sour Soup	2.10
憂	花	*	64.	Egg Drop Soup1.10	2.10
雪	吾	*	65.	Egg Drop Wonton Mix	2.10
료	腐 菜	*	66.	Tofu Vegetable SoupNA	3.50
雞	玉米	湯	67.	Chicken Corn Cream SoupNA	3.50
臀	肉玉米	湯	68.	Crab Meat Corn Cream SoupNA	3.50
海	鮮	*	69.	Seafood SoupNA	3.50

Example from Adam Lopez



