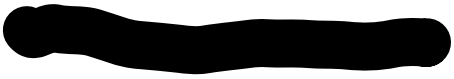
READING ASSIGNMENT 4
16785-Integrated intelligence in robotics



1. Efficient Grounding of Abstract Spatial Concepts for Natural Language Interaction with Robot Manipulators

A robot working alongside humans must possess the ability to understand and parse natural language to perform optimally. Prior work has shown high success rate only when parsed instructions were mapped to the groundings of the candidate in question. This paper was at the forefront of its time for tackling abstract spatial concepts, cardinality and ordinality.

It deployed a probabilistic approach. This model inputs a set of concrete constituents that are correlated with abstract concepts. A large state space is avoided by eliminating abstract concepts that don,t have correlation. This approach shows accurate results and efficiency gain when evaluated by commanding a robot manipulator with complex instructions

One improvement could be increasing the amount of semantic information and placing equal weights to both abstract and semantic parsing. Also this algorithm must be evaluated on different worlds to understand its ability to generalize. The authors have assumed the presence of spatial relations such as left, right, etc which may vary depending on worlds and frame of reference.

2. Style Transfer from Non-Parallel Text by Cross-Alignment

Style transfer is the task of rephrasing the text to contain specific stylistic properties without changing the intent or effect within the context. This paper introduced at the time a fairly different approach for style transfer called cross-alignment. t basically used neural networks to force alignment (invariance) over sentence populations. It also tackled non-parallel text data which had little prior research in the field. This method proved very successful for decipherment of word substitution ciphers and recovery of word order. It also had a small increment in success compared to prior work with regards to sentiment modification.

A sentence and its original style indicator are inputs to a learned encoder which maps it to a style independent content representation. Rendering is done by passing it to a style dependent decoder. A shared latent content distribution is assumed across different text corpora. One of the advantages of the deployed mapping technique is that the latent content is left undisturbed and hence provides more informed constraints.

One of the limitations of the paper is that despite showing success in style transfer, it has not proved sentence meaning retention or content preservation. The model is only validated through class accuracy. One way of doing this would be to ground the sentence to some language translation so that the actual meaning and fluency is reserved. Back propagation could be deployed for this. Then one can set about performing cross alignment for style transfer.