

# hw07\_papers

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## Analysis of "A Natural Language Interface to a Robot Assembly System"

### Discussion:

This paper discusses a method of implementing a natural language interface for a robotic assembly system. The system, that the writers discuss, succeeds in accomplishing a set of goals that the writers claim any system trying to accomplish the same feat needs to meet. The system "must provide flexible communication between the robot system and the user to enable the user to control the system with little knowledge of the system's details. To accomplish this, it must be flexible enough to handle variant syntax, missing input words, handle mixed-initiative conversation and ellipsis. Provided these abilities, the users should be able to direct the vision processing and the manipulation of the system by natural language interaction. If the system does not know how to perform the desired action, it should ask the user for an explanation." The authors then state that in order to accomplish these goals natural language processing, robot control, vision processing, learning, and overall system architecture must be explored and implemented. The writers then explain each of these parts of their system design.

### Likes:

The most interesting parts of this paper were the figures and the listing of a full user session. For me, sometimes the simplest parts are where I glean most of my information. From these two parts it was easy to see how much thought went into the capacity to implement this system. The user session was the most interesting for me after having done the ELIZA homework and learning about conceptual dependencies. It helped me to appreciate that even though the system's vocabulary is only 50 words at the start, the possible responses and actions tied to those concepts had to be well done and flushed out to account for most if not all usages of those words and similar phrases.

### Dislikes:

The part I disliked about this paper was the overlying ambiguity throughout each section. It was almost as if the authors were actively trying to be as vague as possible when trying to say something concrete. After going through it twice I believe that the system wasn't actually implemented but the ambiguity of their statements makes that a hard conclusion to make.

### Inspiration:

Inspiration wise I didn't get much from this paper, however, whether the authors did not actually implement their discussed system or they did, this paper's overall feel and layout is a great method of writing up a proposal for a project. They discussed their design, what materials and equipment they would need, what each coded system would be programmed in and how, and they discussed how each part would interact in order to achieve their desired results.

## Analysis of "Mobile Robot Programming using Natural Language"

### Discussion:

This paper discusses a similar topic as "Mobile Robot Programming using Natural Language" where the authors make a conclusion that domestic use robots won't be useful unless they are capable of learning from their users in a way that users who are unable to program can pass along the information for new tasks using natural language. The authors go on to describe their own system that is similar in function to the one described in the previous paper but different in overall execution. The system described in this paper is meant to use Instruction-Based Learning (IBL) where the robot will start with a preset vocabulary linked to specific actions and movement paths. The robot will then use its current knowledge to chart its path based on the language the user uses. If the robot does not already have a specific path or action that corresponds to the user input it will ask the user to describe the path using the vocabulary it already knows and will then create the new path to be used in future commands.

### Likes:

The most interesting parts of this paper were also the figures and tables that were included. These provided the same information as that paper but in a format that was easier to understand for future application. I also liked that the tables showed detailed representation of the starting knowledge of the system and how the system would interpret and process user input. For this purpose, table 2 was definitely my favorite. I also like how this paper was much less ambiguous in its language. It not only described what frameworks, and components were used to build the robot, but the authors also went into detail of how they tested the robot. The use of 24 individuals to guide the robot was a great way to make sure that the system was general enough that it could be used by a wide variety of people. If only one person were to use it I would be worried that the natural language processor wasn't correctly identifying the wording used.

### Dislikes:

While reading I didn't really find any faults with this paper. I enjoyed the content and the relevant information was presented in a simple and straightforward manner.

### Inspiration:

My main inspiration from this paper is the "where there's a will there's a way" attitude. Even without much space for a practical test of the system using a complex area the

writers were able to make a complex course in a tiny area and they were still able to do a comprehensive test.

## Analysis of "The Language of Music: Common Neural Codes for Structured Sequences in Music and Natural Language."

### Discussion:

This paper discusses the method in which the authors try to see if Broca's area, an area of the brain that is known for processing structured sequences in language, is a common substrate of between the brain processing language and music from structured and non-structured sequences. The authors capitalized on the fact that both language and music are characterized by discrete elements that can be combined to form organized structures, in order to test 21 individuals. An fMRI machine was used to map each individual's brain as they were told to construct sentences or musical phrases based on given verb and musical notes respectively. Then the images were studied to find an overlap in the neural processing of the different kinds of tasks.

### Likes:

I liked every part of this paper as I found it really interesting. Nothing really stood out to me though. I suppose that the part I respected the most was that when they had an overwhelming outlier in their participants they recruited the 21st participant to ensure that they had 20 participants that fit the very carefully chosen characteristics that they used to generalize normal brains in regard to processing both music and language. I also like that they didn't ignore that outlier they just wanted to ensure they had a full set of data.

### Dislikes:

I enjoyed this paper and didn't encounter anything that I could say that I disliked. The only thing that bothered me was their vocabulary as it was plain to see that this paper was written for people with experience in the field of neuro-science, as there were many terms that weren't explained that I needed to look up to make sure I understood what was being said.

### Inspiration:

I was always a believer in musical language. I found it quite interesting that it has been scientifically proven that there is significant overlap in brain activity in when the brain processes and generates language and music. I figure that music might be similar in how we look at code as a type of language as well. It's a way of generating sequences in specific patterns to convey a message to someone. Music may not be able to convey words but it can definitely convey feelings and emotions. Maybe one day we might be able to control programs using notes and frequencies instead of letters and numbers.