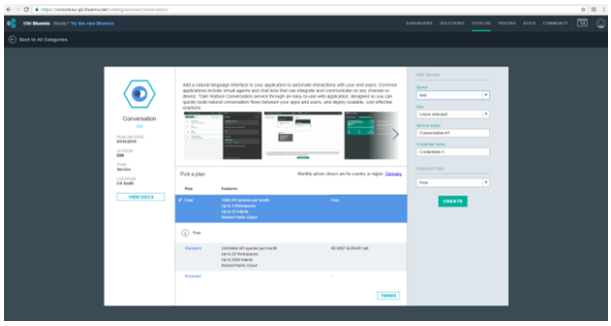
Una revisión de las herramientas de comprensión del lenguaje - Conversación de IBM

7 de noviembre de 2016 / en Inteligencia Artificial , Big Data , Data Science , Gerneral , Machine Learning / por Vishal Bhalla

In the first part of this series [https://www.data-science-blog.com/blog/2016/10/26/a-dialogue-on-the-recent-advances-in-conversational-artificial-intelligence-ai/] , we saw how top firms with their different assistants are vying to acquire a space in the dialogue market. In this second and final part of this blog-series on Conversational AI, I go more technical to discuss the fundamentals of the underlying concept behind building a Dialogue system i.e. the cornerstone of any Language Understanding tool. Moreover, I explain this by reviewing one such Language Understanding tool as an example that is available in the IBM Bluemix suite, called as IBM Conversation.

IBM Conversation within Bluemix

IBM Conversation was built on the lines of IBM Watson from the IBM Bluemix suite. It is now the for dialogue construction after IBM Dialog was deprecated.We start off by searching and then creating a dedicated environment in the console.



[http://data-science-hack.com/wp-content/uploads/2016/11/ibm-bluemix-screenshot-1-1.png]

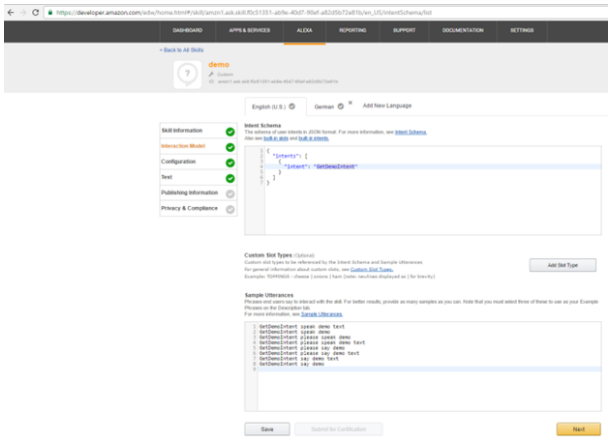
Setting up IBM Conversation from the Bluemix Catalog/Console

Basics

Conversation component in IBM Bluemix is based on the Intent, Entity and Dialogue architecture. And the same is the case with Microsoft LUIS [https://www.luis.ai/] (LUIS stands for Language Understanding Intelligent Service). One of the key components involves doing what is termed as Natural Language Understanding or NLU for short. It extracts words from a textual sentence to understand the grammar dependencies to construct high level semantic information that identifies the underlying intent and entity in the given utterance. It returns a confidence measure i.e. the top-most extracted intent out of the many pre-specified intents that gives us the most likely intent from the given utterance as per our trained model.

These are all statistically/machine learned based on the training data. Go over the demo, tutorial and documentation [https://www.ibm.com/watson/developercloud/conversation to get a more in-depth view of things at IBM Conversation.

The intent, entity and dialogue based architecture forms the crux of any SLU system to extract semantic information from speech and enables such a system to be generic across the various Language Understanding toolkits.



[http://data-science-hack.com/wp-content/uploads/2016/11/alexa-interaction-model-ask-screenshot-1-1.png]

The Alexa Interaction model based on intent and slots in ASK

Another huge advantage that ASK provides for building such an architecture, is that it has multi-lingual support.

Conceptual Mapping

Intents can be thought of as classes where one classifies the input examples into one of them. For example,

Call Mark is mapped to the ***MOBILE*** class and *Navigate to Munich* is mapped to the ***ROUTE*** class

The entities are labels, so e.g. from above, you can have

Mark as a ***PERSON*** and *Munich* as a ***CITY***.

Major advantage and drawback

Both Conversation and LUIS use a non-Machine Learning based approach for software developers or business users to create a fast prototype. It is definitely easy to begin with and gives a lot of options to create drag and drop based dialogue system. However, it can't scale up to large data. A hybrid approach that can combine or build a dynamic system on top of this static approach is needed for scalable industry solutions.

Extensions

Moreover, an end to end workflow can be built by plugging in components from Node-RED

[http://nodered.org/] and introduction to the same can be viewed in the below video.

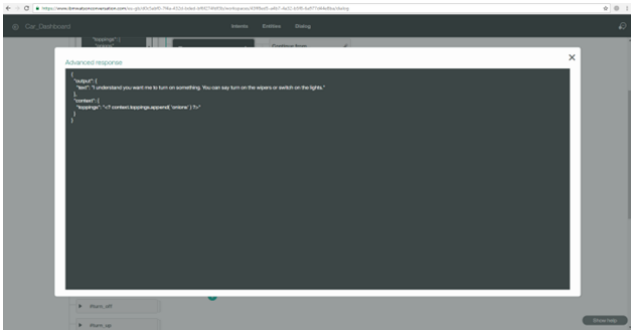
What's good is that they have a component for Conversation as well. So, we can build a complete chatbot starting from a speech to text component to get the human commands translated to text, followed by a conversation component to build up the dialog and lastly by a text to speech component to translate this textual dialogue back to speech to be spoken by a humanoid or a mobile device!

Missing components and possible future work

It is not possible to add entities/intent dynamically through the UI after the initial workspace is constructed. The advanced response tab doesn't allow to edit (add) the entities in the response field, like for example adding variables to the context. We can edit it (highlighted in orange) but it doesn't save or get reflected.

```
{
"output": {
"text": "I understand you want me
to turn on something. You can say
turn on the wipers or switch on the
lights."
},
"context": {
"toppings": "<?
context.toppings.append( 'onions' )
?>"
},
"entities": {
  "appliance": "<?
entities.appliance.append( 'mobile' )
?>"
}
}
```

Además, el enlace [https://www.ibm.com/watson/developercloud/doc/convers que solo menciona el acceso a intenciones y entidades pero no las modifica.



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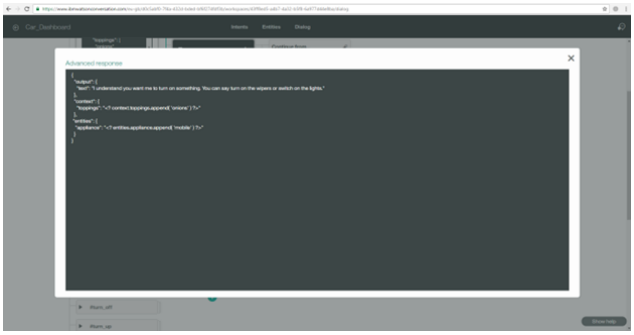

[http://data-science-hack.com/wp-content/uploads/2016/11/watson-developer-cloud-screenshot2-1-1.png]

El único lugar para agregar el intento, las entidades está de regreso en el espacio de trabajo y no programáticamente en tiempo de ejecución. Tal vez, una posible solución sea utilizar la IU con datos de BD para guardar los valores de intent / entity intermedios y recientemente descubiertos y luego actualizar el espacio de trabajo más adelante.

Cuando termine este blog, tal vez habría otro asistente de inteligencia artificial que se haya movido más allá de su etapa embrionaria para conquistar escenarios de aplicaciones de la vida real. La IA conversacional es una gran ventaja, así que sumérgete para aprovechar sus beneficios, tanto desde el usuario final como desde la perspectiva del desarrollador.

Nota: *Espero que hayas disfrutado la lectura. He mantenido deliberadamente el contenido con una mezcla de elementos no técnicos y técnicos para crear la emoción y el rumor de este emocionante campo de IA conversacional. La publicación de este blog estaba en mi lista ya que estaba compilando muchos datos desde las últimas semanas, pero tenía que apurarme aún más, dadas las noticias*

recientes sobre este aumento. Como siempre, cualquier comentario como un comentario a continuación o a través de un mensaje son más que bienvenidos.

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Vishal Bhalla es un estudiante de maestría en la Universidad Técnica de Munich (TUM). Su principal enfoque es la Inteligencia Artificial y está interesado en aplicar la combinación de AI, NLU y Aprendizaje Relacional Estadístico en todos los dominios. Aparte de eso, es un gran entusiasta de los deportes y un escritor de deportes en [http://www.sportskeeda.com/keeda/vishy_punditry] ciernes ; produciendo artículos por diversión. A Vishal le gusta correr riesgos, viajar y explorar la naturaleza y ama el sarcasmo y las vistas independientes.

Comparte esta entrada

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Dorie
19 de noviembre de 2016 a las 7:55 a.m.

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Respuesta

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2. Un "Diálogo" sobre los avances recientes en Inteligencia Artificial Conversacional (AI) - Blog de Ciencia de Datos
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