



Trading Assistant - IMC

Group Night-owls November

Project brief

*“Not all trading happens on the exchange -- sometimes counterparties trade directly through human-to-human communication. In such cases, humans typically use their most natural interface: voice. Your task is to create a service which holds **market data** and **responds to queries** on demand in a **human-like manner**, by **automating** one side of the process using modern technologies (voice recognition, natural language processing and voice production).” - IMC Trading*



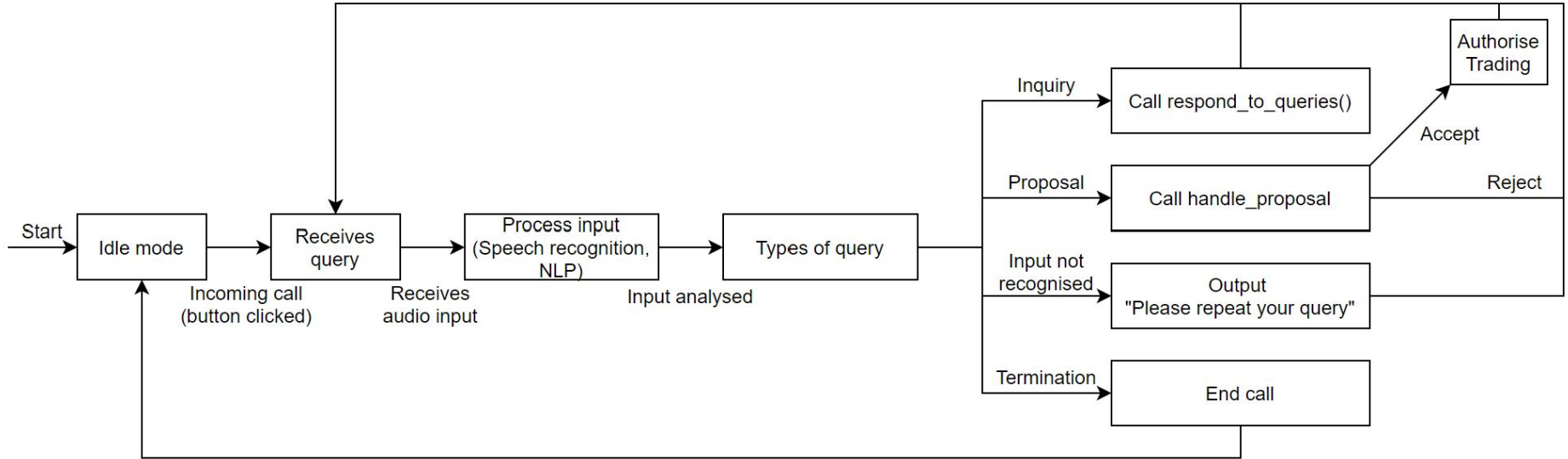
Aim?

Our goals and what we set out to do

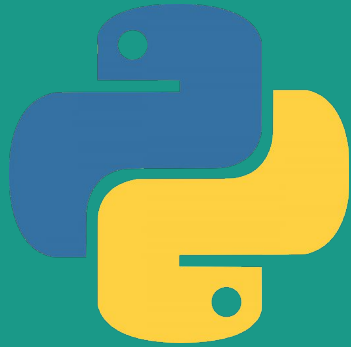
- **“To replace human traders”**
– *Evald Monastyrski, our client from IMC*

- **“Everyone is getting out of a job. Well done, AI!”**
– *Dr Sean Holden, Director of Studies at Trinity College*

Project structure



Technologies



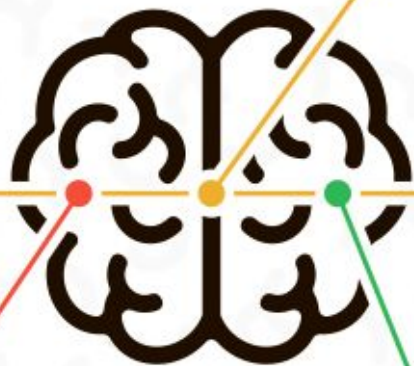


Speech Recognition and Voice Production

- Google Cloud Speech-to-Text & Text-to-Speech
- Streaming speech recognition from microphone
- Outputs a string which is processed and pipelined
- Reads string aloud.
- Rinse and repeat.

The world out there,
made up of sub atomic
particles

INPUT >



Linguistic

Linguistic Map

Conscious mind
Description

> **OUTPUT**

Neuro

First Access

Internal images
Sounds and feelings

Programming

Behavioural response

Neurological filtering
processes



NLP



- Gathering of raw data and pretrained models
- Preprocessing steps for sentences
- Tokenization and tf-idf weighting
- Word embeddings and cosine similarity
- Sentence embeddings with Siamese BERT-Networks.
- Naive-Bayes approach



Frontend

*A dashboard that allows a supervisor to observe the **behavior** of the trading assistant, the **conversations** it had with brokers and what **transactions** it completed during the current session.*

TRADING ASSISTANT



DASHBOARD



STOCKS



TEST NLP



• TEST SPEECH RECOGNITION

Listening here!

Start conversation

The text listened is...

What follows is the exchange between the trader and program.

Trading Assistant! Make your \$\$\$

PT

Pritchard The Trader 10:58 AM

Ask something!





Backend

- Developed primarily in **Python**
 - Natural Language (word2vec, Siamese BERT, Naive Bayes)
 - Decision making
 - Voice recognition and voice production
- Flask microframework to integrate with **Angular** frontend.
- Persistent storage for transactions done through **PostgreSQL** database.
- Used a variety of financial APIs for information (WorldTradingData, etc)



Key Takeaways

Lessons learned and moving forward.

- Have more specific, documented interfaces to avoid ‘unpleasant surprises’
- NLP is an inherently difficult problem but made easier by constraining to a single problem domain
- Leave more time for integration of different components
- Try to go to bed before 5AM



Special THANKS to:

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