



MeetUp Mania

Welcome

AI Programming: no need to be drunk

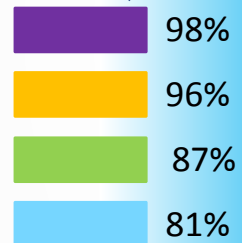
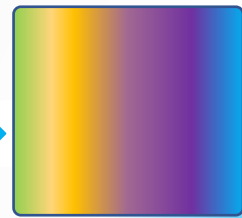
By: Lior Messinger, CEO/CTO at [Servo.ai](#)

A Typical AI Project

Sensors /
Data

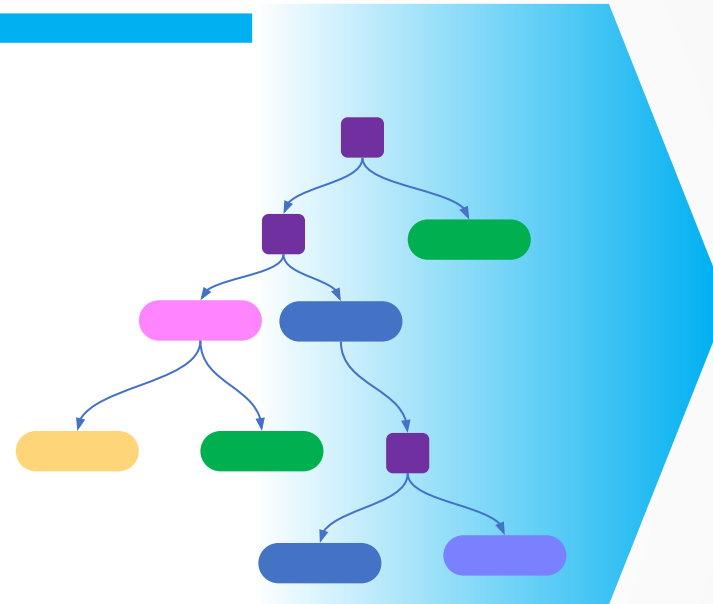


AI Classification
Models

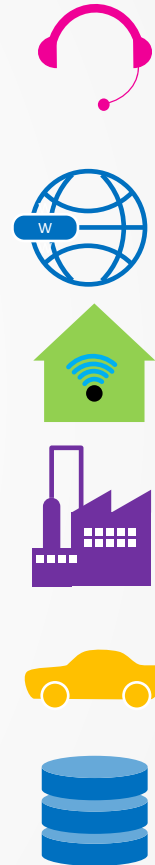


Google (Tensorflow)
IBM (Watson)
Microsoft (Azure)
Amazon...

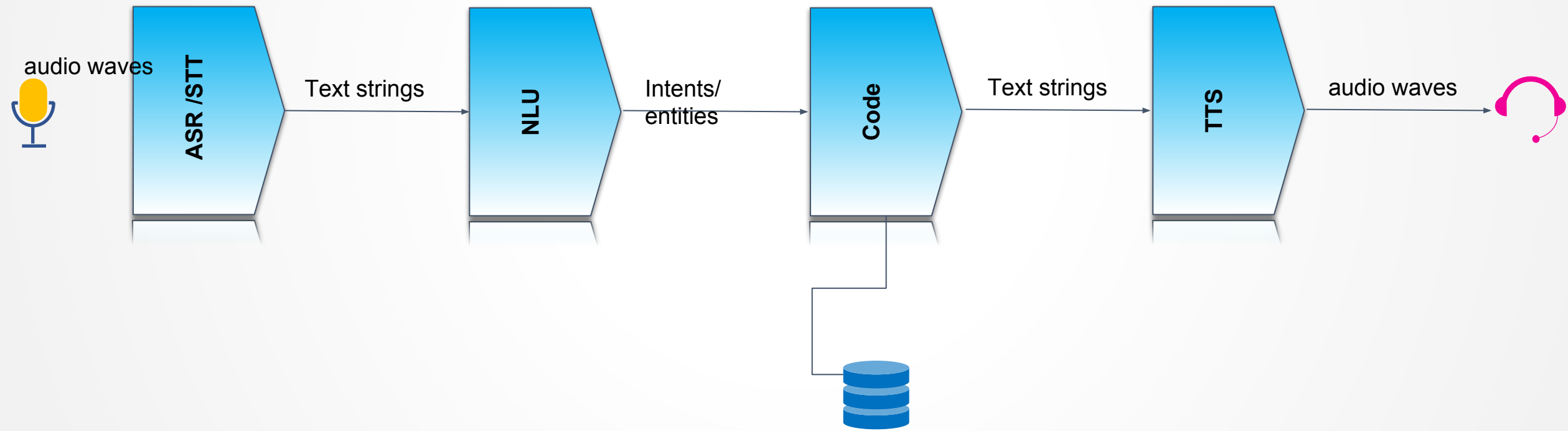
Logic Rule Engine



End Product



Voice Path



We will use

- Chrome as the ASR client
- Chrome for the TTS
- Other options:
 - Alexa
 - Android voice
 - Windows speech

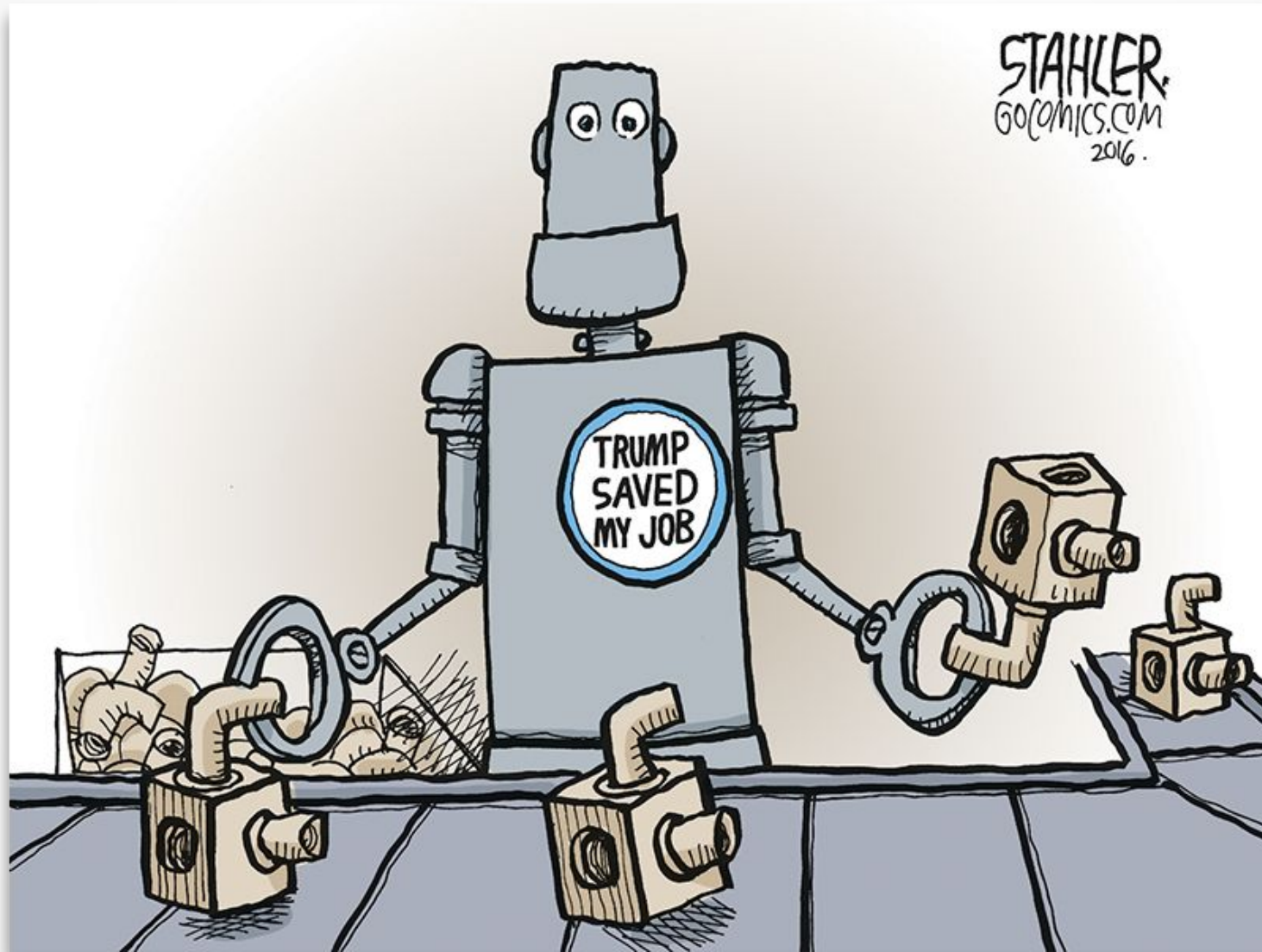
We will use

- Wit.ai as the NLU
- Other options:
 - LUIS
 - IBM watson
 - Google STT
 - Rasa.ai (open source)
 - Spacy (open source)

Please Meet

- `webkitSpeechRecognition`
- `speechSynthesis`

build it



Let's build it

I'm not your toy:



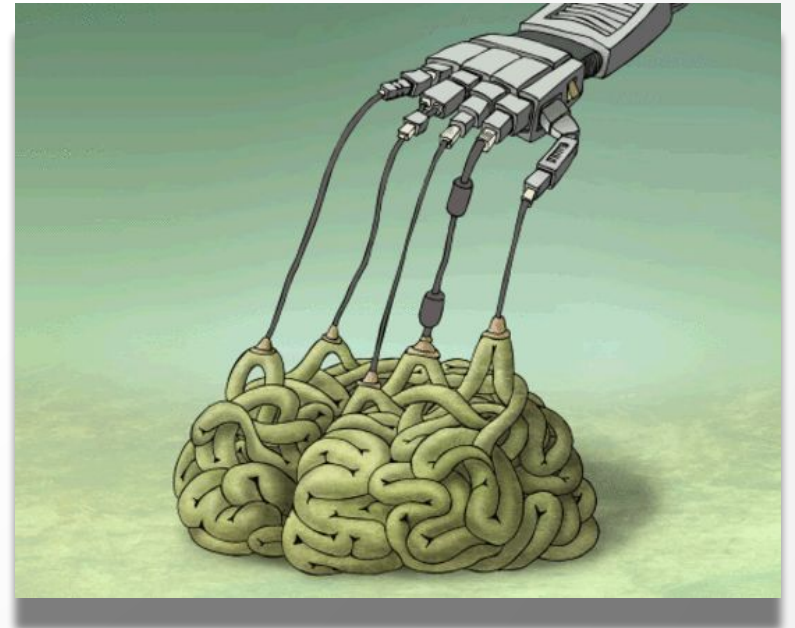
A few extensions to make it real

On Chrome

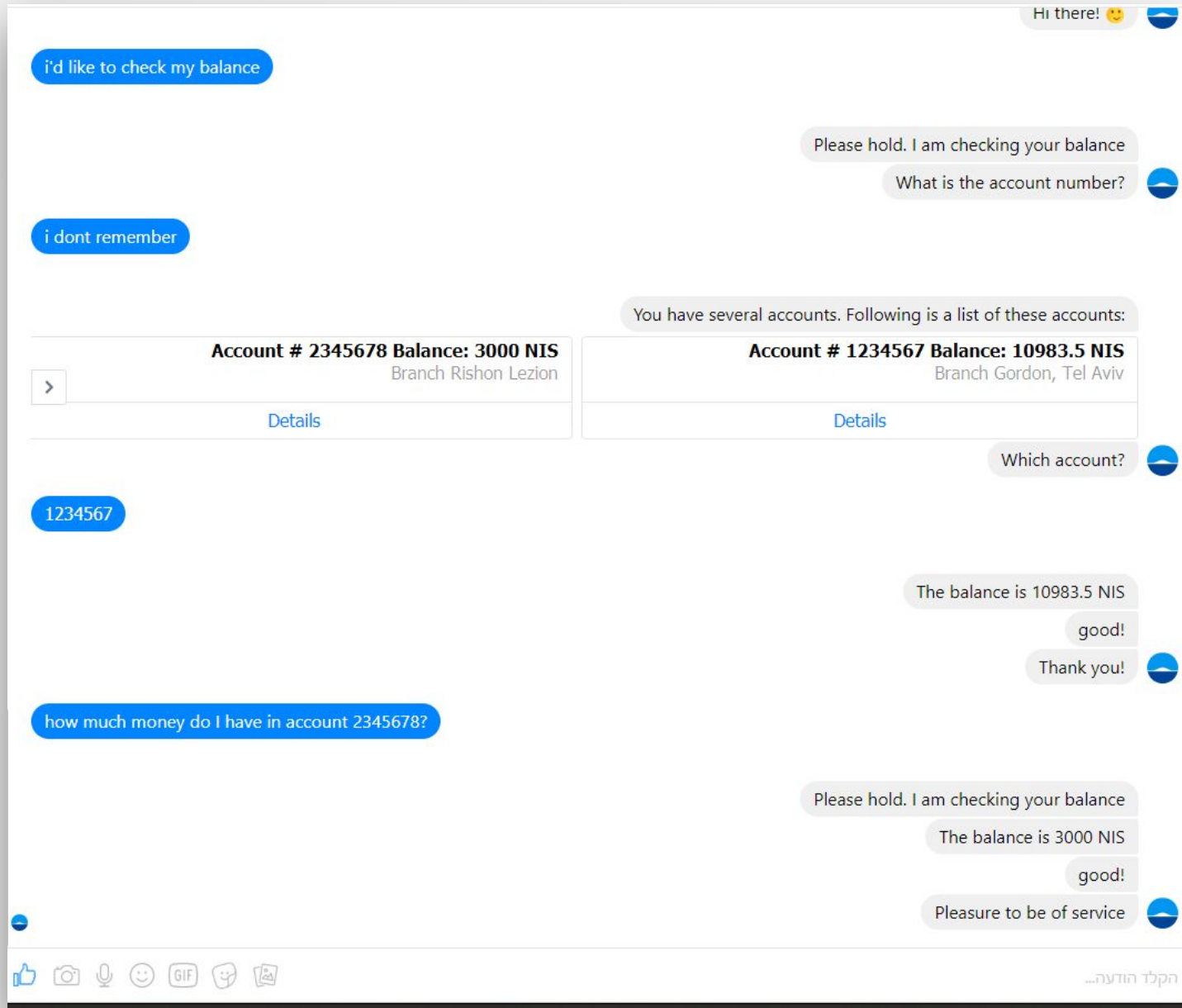
- PTT / Wake word
- Chrome ASR Bugs:
 - listens to TTS
 - need to close and open
 - Asr never finalize
- Asr stops after a while

In general

- Complex to build conversations
 - a lot of state to handle
- Context is king



The Technical Problem



Chatbots can do very well one topic at a time

The Technical Problem

But will behave poorly
when dialog deviates
from fixed flows

i'd like to wire some money

333877

hmm

I'll be more than happy to assist in money transfer
For that I'll need to get more information.
what is the account number you are wiring to?

Wire will go out to account number 333877
what's the amount you'd like to transfer?

I need to know the amount to wire
?would you like to see the recent transfers

Show last transfer
Recent transfers
Cancel wire

how much money do I have?

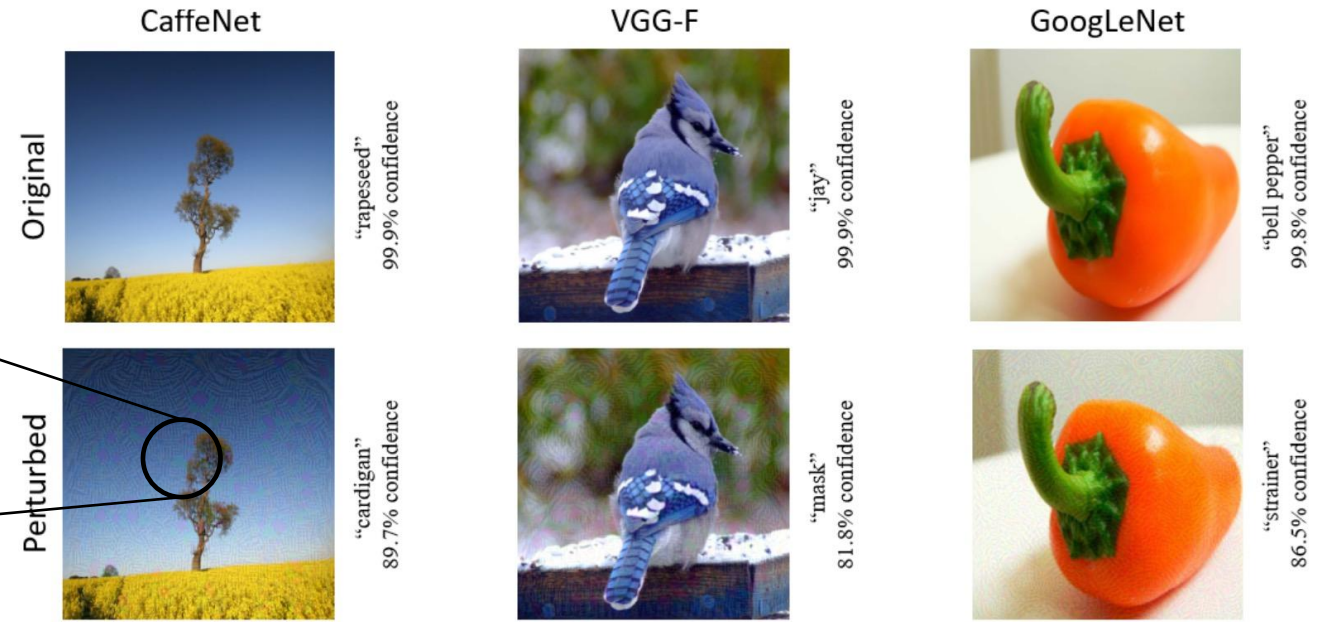
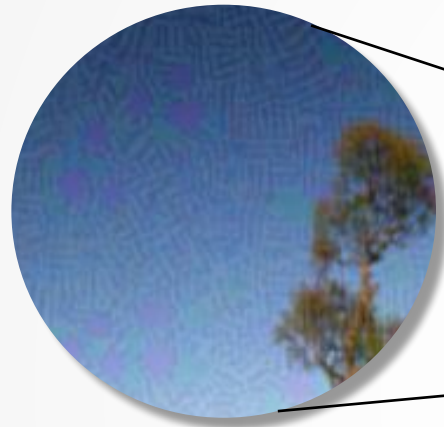
can i speak to a representative?

what's the amount you'd like to transfer?

what's the amount you'd like to transfer?

👍 📷 🗣️ 😊 GIF 🗨️ 🖼️

...קבל הודעה...



Threat of Adversarial Attacks on Deep Learning in Computer Vision: A Survey),
author=(Naveed Akhtar and Ajmal Mian)
journal=(IEEE Access) year=(2018)

“...humans are able to correctly classify the adversarial image with relative ease, whereas the CNNs predict the wrong label, usually with very high confidence.”

Measuring the tendency of CNNs to Learn Surface Statistical Regularities. JO & Bengio, 2017

When one model handles several ML layers, once conditions are changed (image clarity), the models does not work

“...Instead of making predictions in the sensory (e.g. pixel) space, the consciousness prior allows the agent to make predictions in the abstract space“

The Consciousness Prior, Y. Bongio, 2017

The end

Why did we build it?

A few issues with AI

The New York Times

Tech Giants Are Paying Huge Salaries for Scarce A.I. Talent

Nearly all big tech companies have an artificial intelligence project, and they are willing to pay experts millions of dollars to help get it done.

- **Businesses want to add AI but:**
- **Shortage of AI experts at all development layers**



WHY?

Because AI understands by pixels,
frequencies and data

Humans understand using pixels,
frequencies, data - and **context**

Dictionary



con·text

/ˈkæntekst/ 

noun

the circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood and assessed.

"the decision was taken within the context of planned cuts in spending"

synonyms: circumstances, conditions, factors, state of affairs, [situation](#), [background](#), [scene](#), [setting](#)
[More](#)

- the parts of something written or spoken that immediately precede and follow a word or passage and clarify its meaning.

"word processing is affected by the context in which words appear"

3 Pillars to Solution

1st Pillar: Orchestration Environment

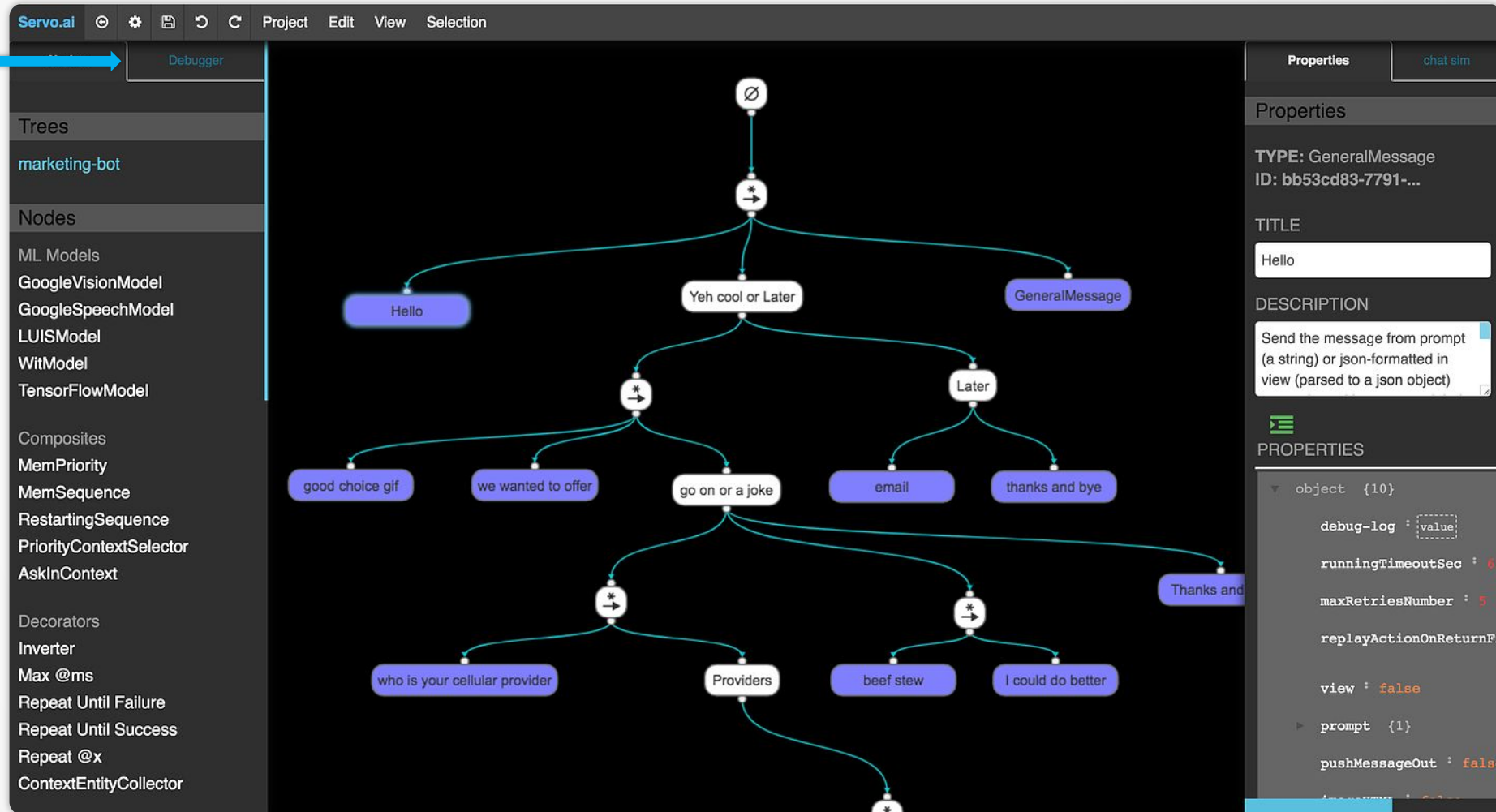
An end-to-end AI orchestration platform

Debugger

ML Models

Components

Functions

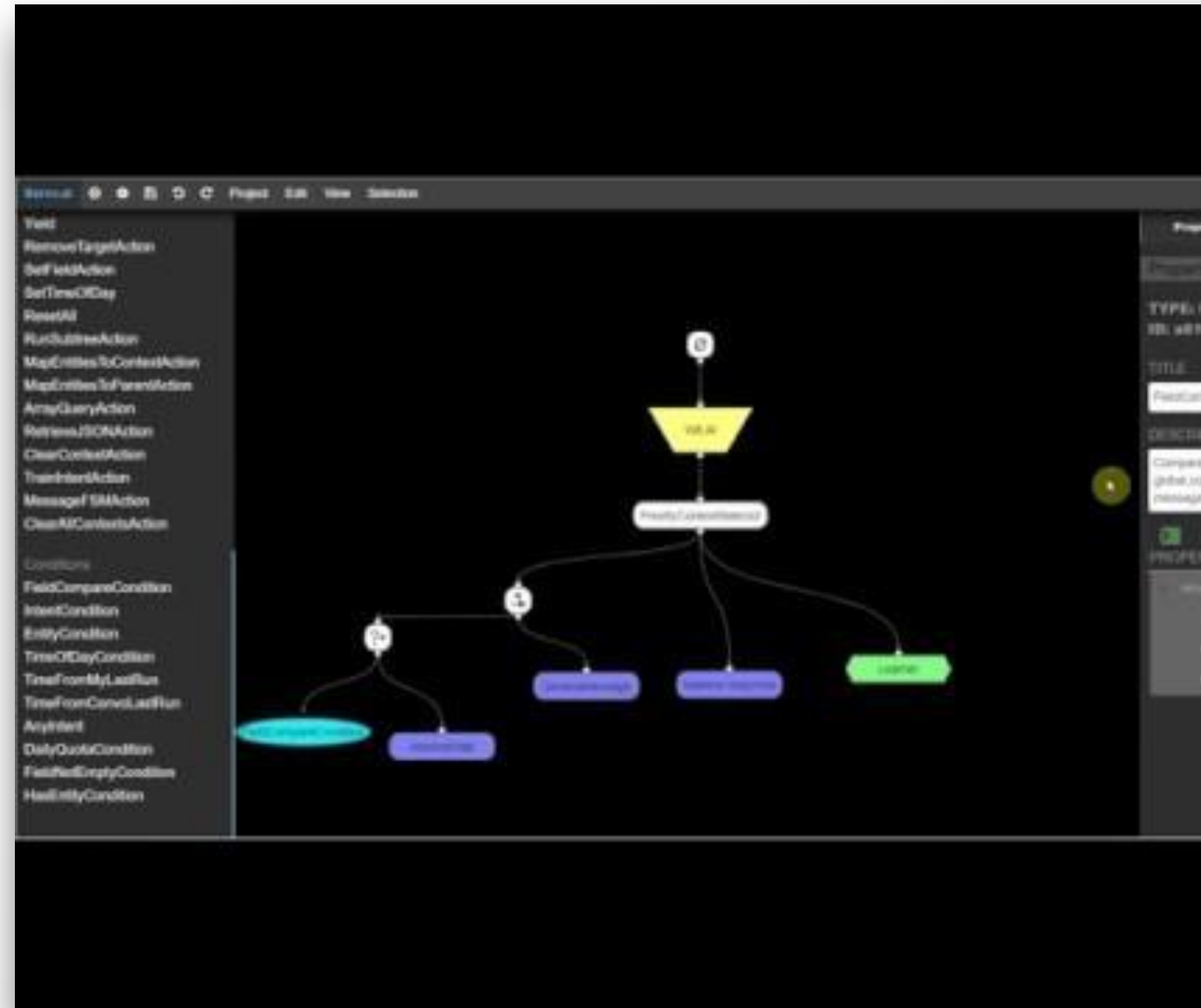


Simulator

Proerties

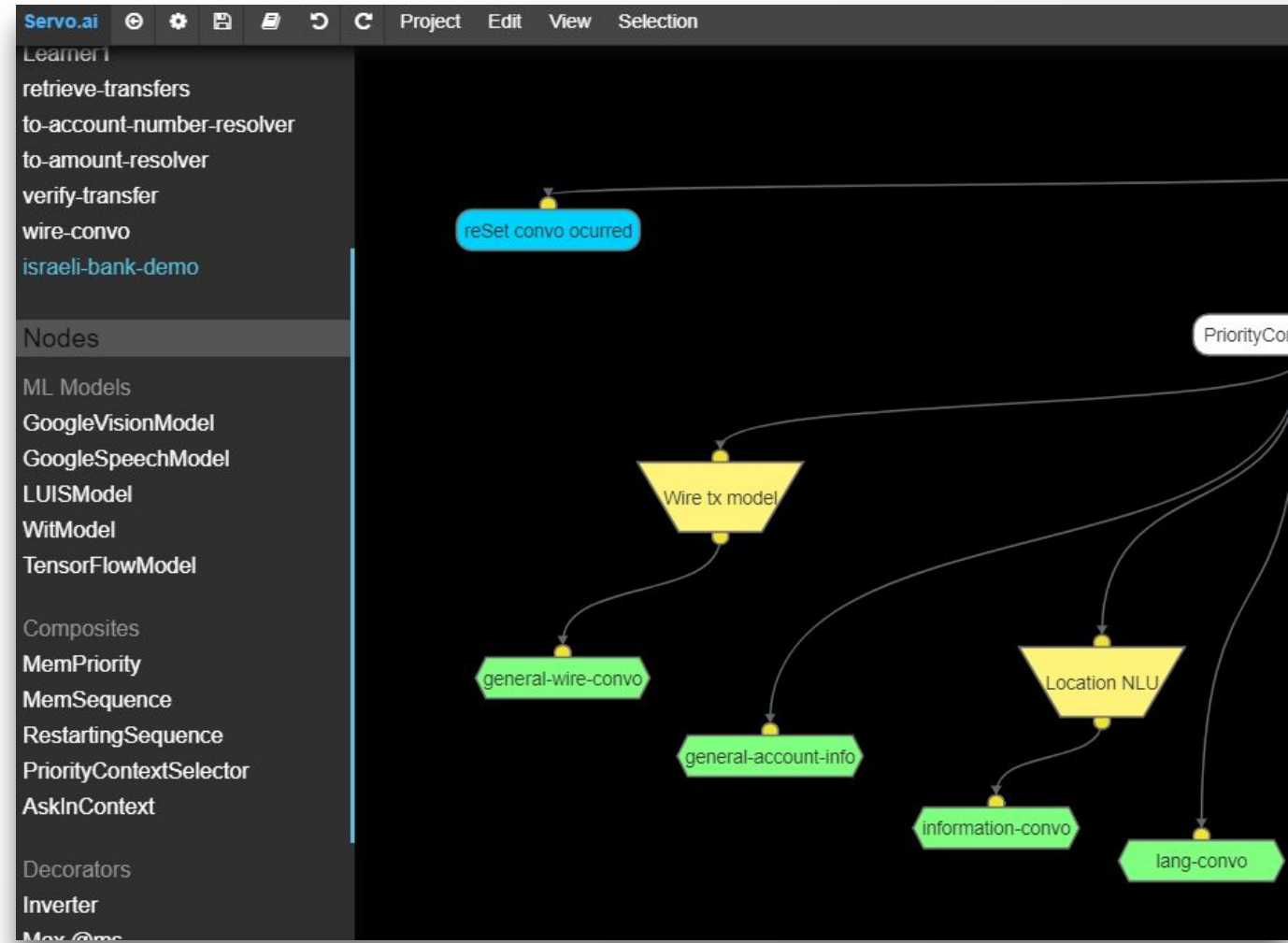
1st Pillar: Orchestration Environment

- Not just AI: **orchestration of AI, logic, databases and sensors**



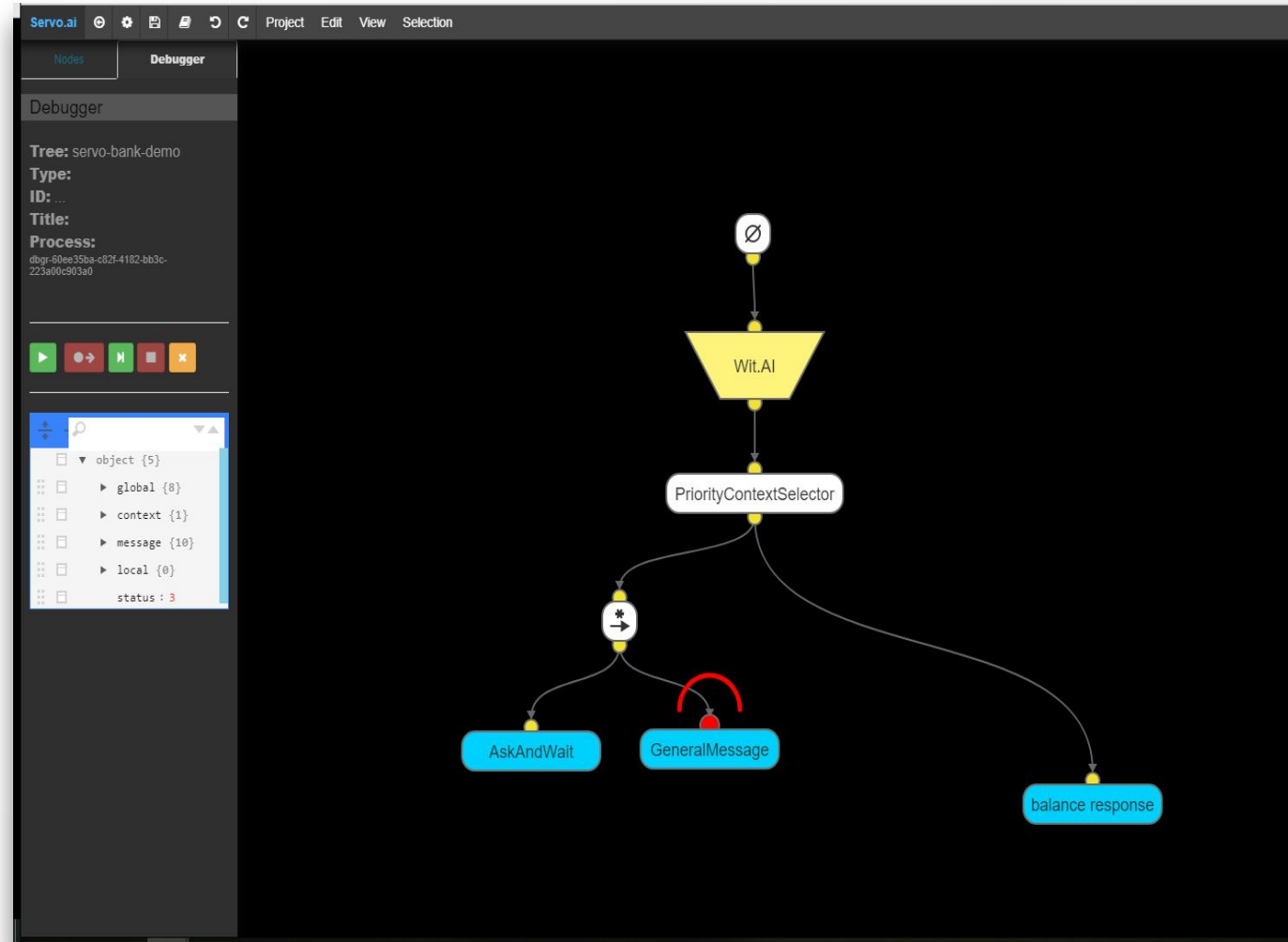
The Solution(s) - 1st Pillar

- Combine **multiple AI/ML models**, automatically selected



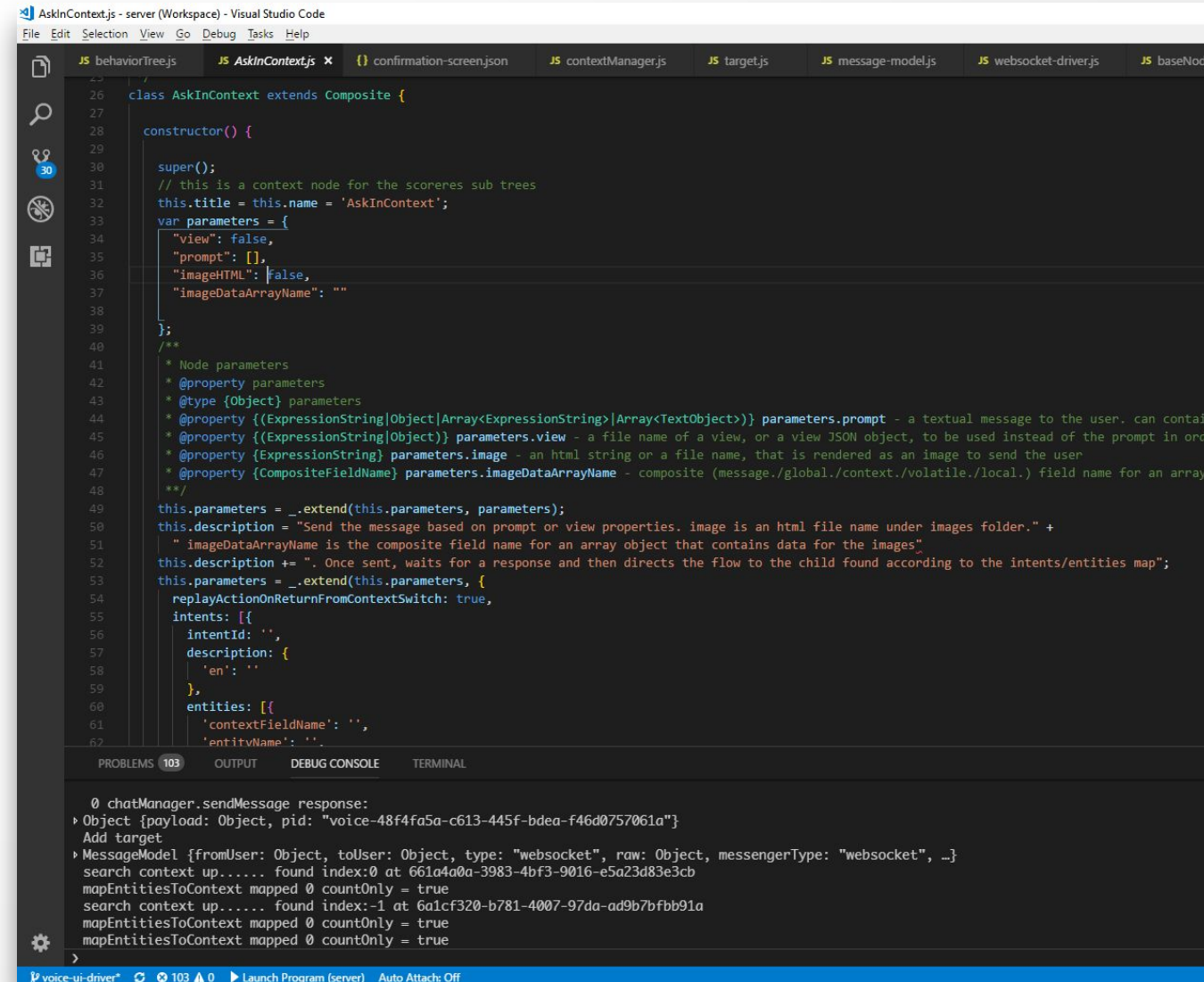
1st Pillar: Orchestration Environment

- No coding needed: **visual development** and debug



1st Pillar: Orchestration Environment

- No coding needed: **visual development** and debug
- Not just visual!



The screenshot shows the Visual Studio Code editor with the file `AskInContext.js` open. The code defines a class `AskInContext` that extends `Composite`. It includes a constructor, a `super()` call, and a `parameters` object. The `parameters` object has properties for `view`, `prompt`, `imageHTML`, and `imageDataArrayName`. The class also has a `description` property and a `replayActionOnReturnFromContextSwitch` property. The `intents` and `entities` arrays are defined at the bottom of the class.

```
class AskInContext extends Composite {
  constructor() {
    super();
    // this is a context node for the scoreres sub trees
    this.title = this.name = 'AskInContext';
    var parameters = {
      "view": false,
      "prompt": [],
      "imageHTML": false,
      "imageDataArrayName": ""
    };
    /**
     * Node parameters
     * @property parameters
     * @type {Object} parameters
     * @property {(ExpressionString|Object|Array<ExpressionString>|Array<TextObject>)} parameters.prompt - a textual message to the user. can contain
     * @property {(ExpressionString|Object)} parameters.view - a file name of a view, or a view JSON object, to be used instead of the prompt in or
     * @property {ExpressionString} parameters.image - an html string or a file name, that is rendered as an image to send the user
     * @property {CompositeFieldName} parameters.imageDataArrayName - composite (message./global./context./volatile./local.) field name for an array
     */
    this.parameters = _.extend(this.parameters, parameters);
    this.description = "Send the message based on prompt or view properties. image is an html file name under images folder." +
      " imageDataArrayName is the composite field name for an array object that contains data for the images"
    this.description += ". Once sent, waits for a response and then directs the flow to the child found according to the intents/entities map";
    this.parameters = _.extend(this.parameters, {
      replayActionOnReturnFromContextSwitch: true,
      intents: [{
        intentId: '',
        description: {
          'en': ''
        }
      }],
      entities: [{
        'contextFieldName': '',
        'entityName': ''
      }
    ]
  }
}
```

The terminal output shows the following log messages:

```
0 chatManager.sendMessage response:
Object {payload: Object, pid: "voice-48f4fa5a-c613-445f-bdea-f46d0757061a"}
Add target
MessageModel {fromUser: Object, toUser: Object, type: "websocket", raw: Object, messengerType: "websocket", ...}
search context up..... found index:0 at 661a4a0a-3983-4bf3-9016-e5a23d83e3cb
mapEntitiesToContext mapped 0 countOnly = true
search context up..... found index:-1 at 6a1cf320-b781-4007-97da-ad9b7bfb91a
mapEntitiesToContext mapped 0 countOnly = true
mapEntitiesToContext mapped 0 countOnly = true
```


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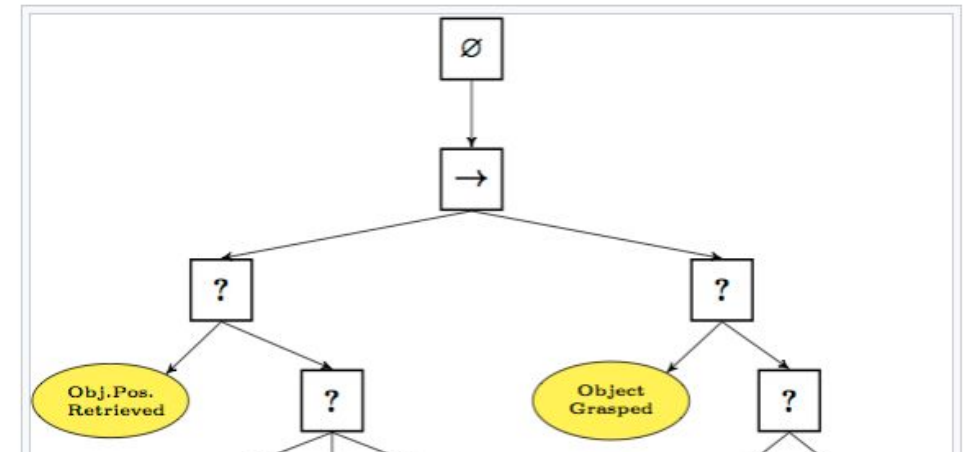
Create a book
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Behavior tree (artificial intelligence, robotics and control)

From Wikipedia, the free encyclopedia

This article is about behavior trees in AI, games, control systems and robotics. For behavior trees in requirements handling, see [Behavior tree](#).

A **Behavior Tree (BT)** is a [mathematical model](#) of [plan execution](#) used in [computer science](#), [robotics](#), [control systems](#) and [video games](#). They describe switchings between a finite set of tasks in a modular fashion. [Their strength comes from their ability to create very complex tasks](#) composed of simple tasks, without worrying how the simple tasks are implemented. BTs present some similarities to [hierarchical state machines](#) with the key difference that the main building block of a behavior is a task rather than a state. Its ease of human understanding make BTs less error prone and very popular in the game developer community. BTs have shown to generalize several other control architectures.^{[1] [2]}

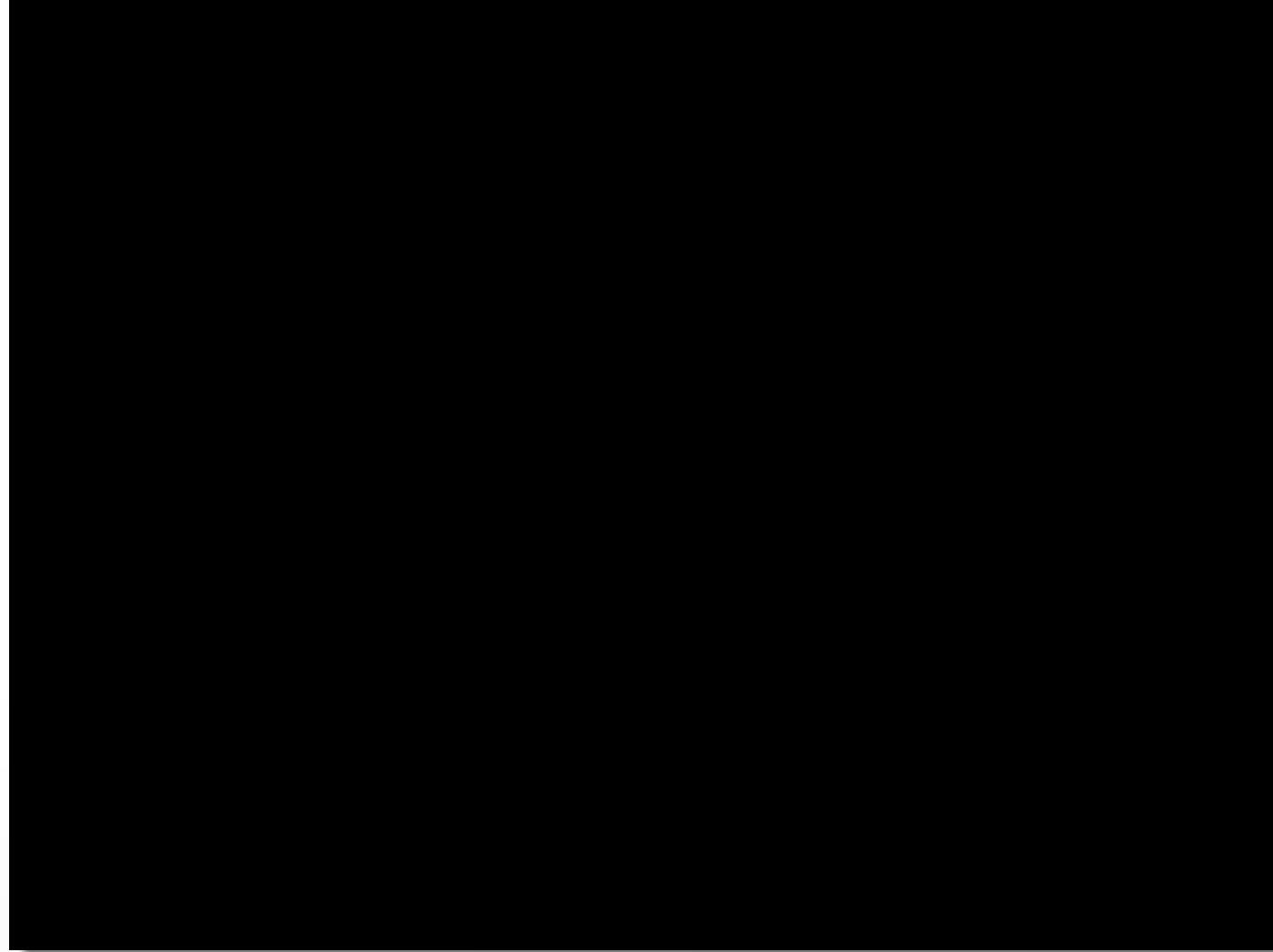


- A standardized paradigm:
Behavior Trees

2nd Pillar: context detection

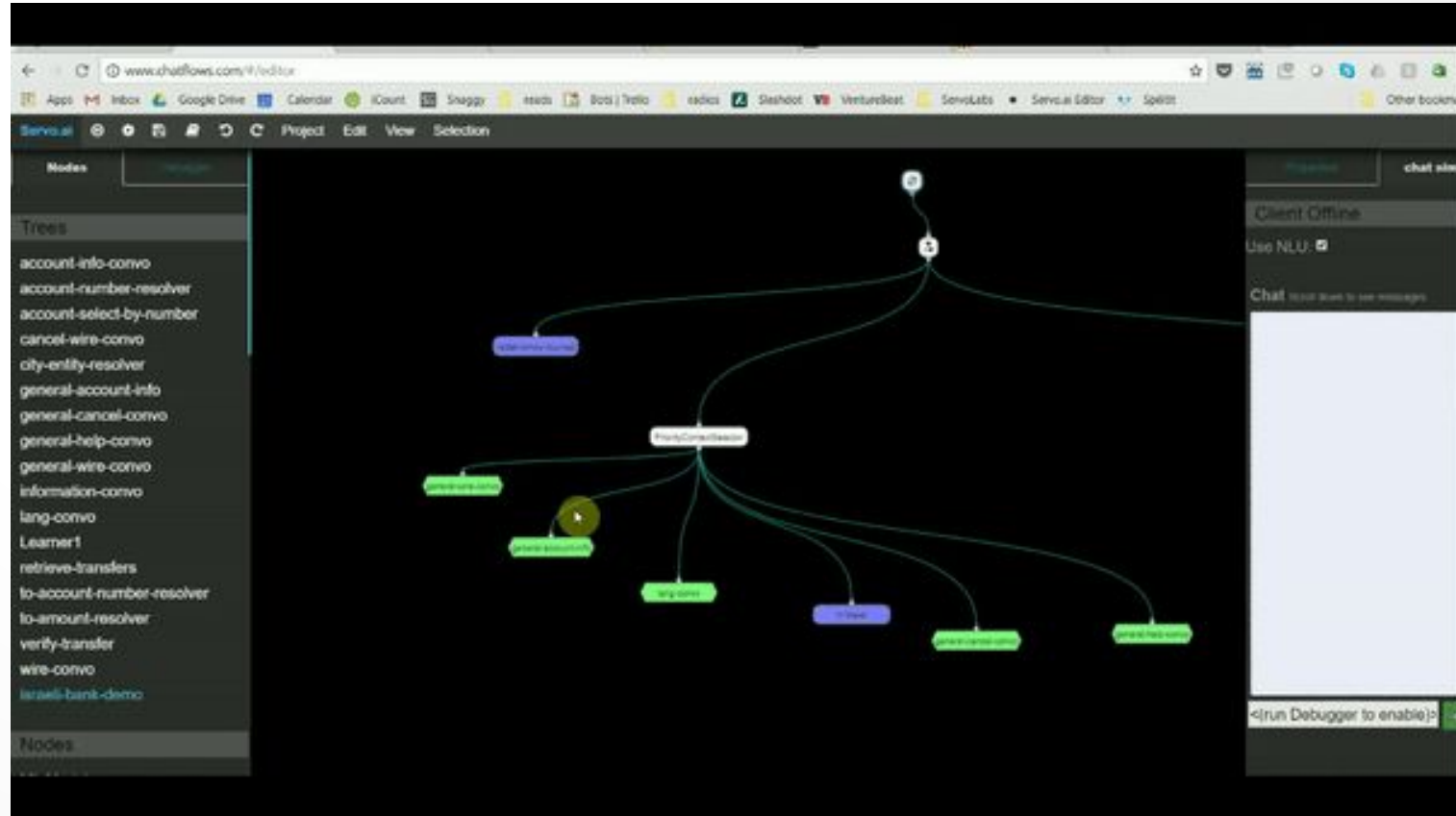
Automatic Context Recognition

- A proprietary patent-pending algorithm
- Eg: engine identifies a balance query during wire-transfer and switch context



3rd Pillar: AI sharing and resharing

- **Easy** drag-and-drop **reuse and share** of full AI modules
- The vision: community-contributed sub-(sub-)behaviors
- Example:
 - A voice bot specialized in location-related dialogs
 - Is re-used inside a banking bot to find branches



The business

servo  **ai Business**

Status

We plan to officially launch the platform on Q4 2018.

Currently:

- In paid POC stage with 2 US clients
- Signed agreements with strategic integrator partner

Business Model

Multi license:

- AGPL - Free for commercial / Personal use. Mandates share of code and bot structure
- Low subscription fees for non sharing bot structure. (Small business / IoT devices)
- Servo (Fully paid - enterprise):
 - Allowing internal, non-copyleft changes
 - Enterprise - oriented features
 - Support (≠professional services)

The business

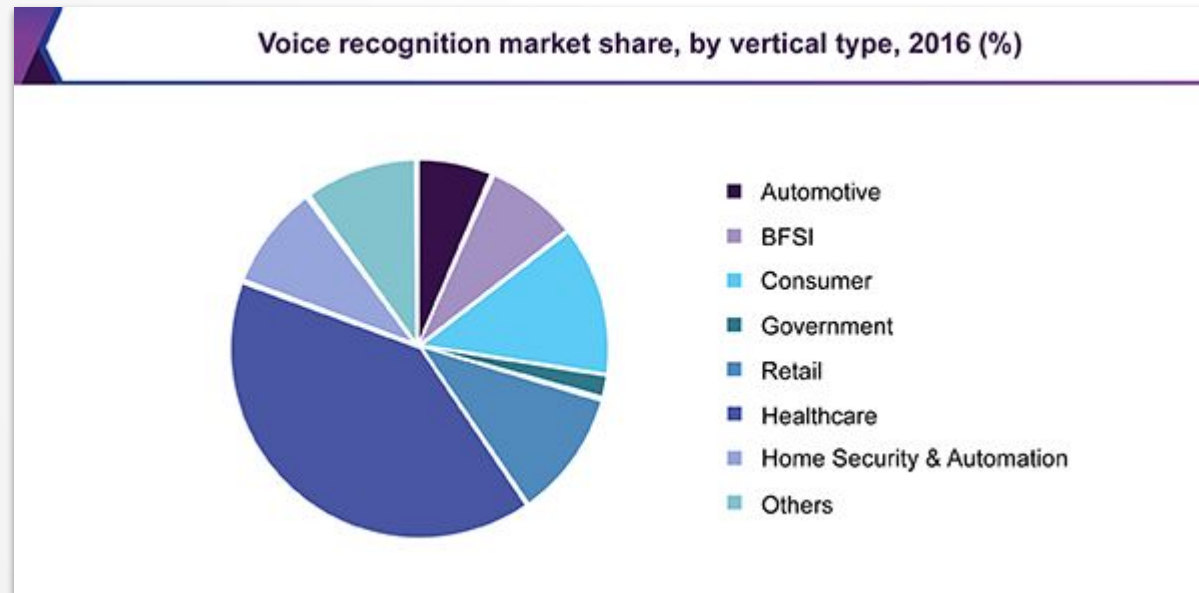
- **2 Goals:**
 - Widespread developer adoption
 - Recurring revenues
- **2 Go-to-market:**
 - B2B
 - Developers

B2B Go To Market

An AI Orchestration Platform
for Augmenting Enterprise Applications
using Voice, Vision and UI Automation
for
Improving Customer Experience and
Increasing Engagement

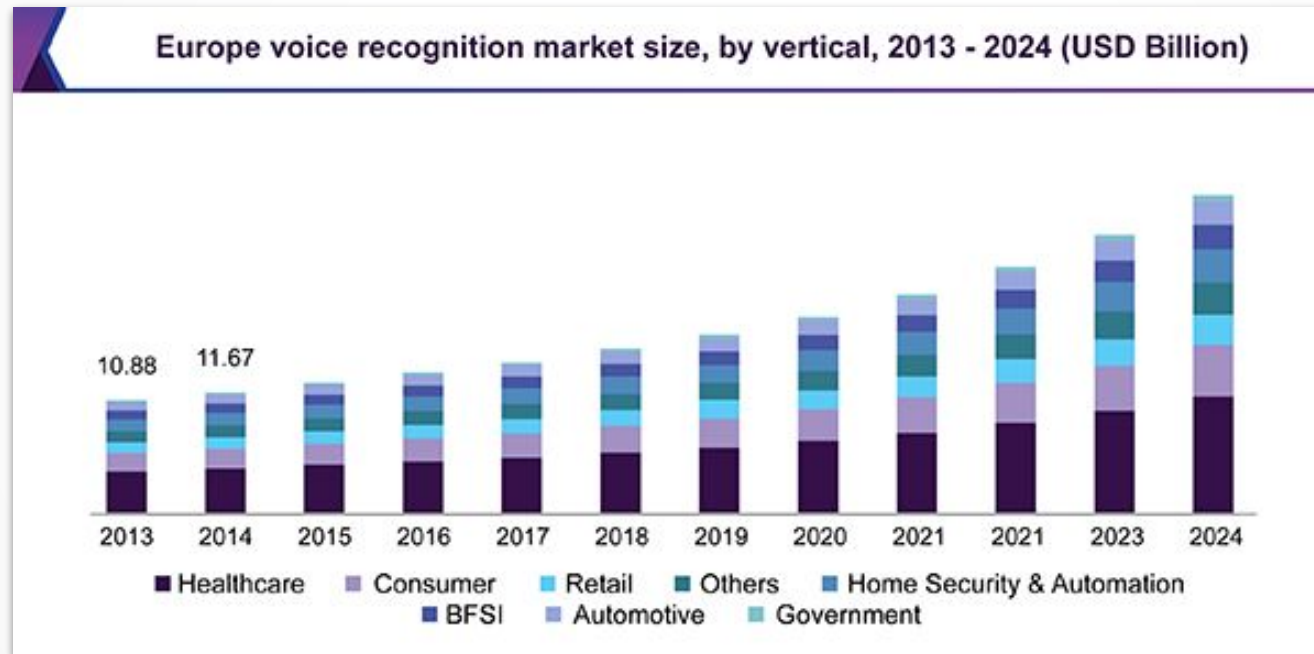
Voice Recognition Market

- Valued at USD 55.17 billion in 2016 [\(1\)](#)
- Still *“lack the ability to understand the context of the language to interpret the content in its true sense”*



Voice Recognition Market

- 11% CAGR until 2024 [\(1\)](#)



B2C Goto Market

- **Servo Developer Community:**
 - Behavior marketplace
 - Social AI development
- **Grassroot reach through developer marketplaces**
 - Platforms: Wix, Wordpress, Magento, Shopify, Drupal...
 - IDE marketplaces: Visual Studio, Eclipse, JIRA
 - AI connectors: Tensorflow, Watson, LUIS

Competitor Analysis

[illegible]

Appendix

About Us

To Summarize



Competitor Analysis - Conversation and automation products

