HECTOR WHITE PAPER

Version 1.0 – September 9th 2019.

Hector

Hector is a psychological artificial intelligent computing software. It is able to assess multiple mental states, such as sentiments, emotions or human needs, providing new context related key insights for Cognitive Computing solutions. Hector can also be tailored to your business context to enhance those psychological assessments.

The information to be assessed is contained within a verbatim (a text file). The content can be taken from a large collection of texts such as voice of the customer material, web pages, online news, internet discussion groups, online reviews or survey responses, blogs or social media content.

Hector is using VirtualBrains

Humans retain information in their long term memory. This long term memory (our database) is organized in a structured way. Information is stored and linked to other information to form a complex network. These links will enable the transmission of some characteristics of one information to another information so that both will share a set of properties. These links will shape a semantic network where many key objects are linked together by a set of properties conveying meaning. Now, knowledge can be represented, can be used while reasoning, making decisions and solving problems. We called this categorized data structure the VirtualBrain. Hector is using specific VirtualBrains to assess sentiments, emotions or needs.

Hector is also able to work with this kind of categorized structure (VirtualBrains) to recognize the meaning contained within business context related unstructured
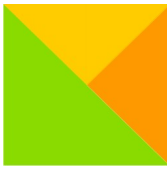
data. This structure is use case specific and can complement the psychological assessments.

Some examples of specific VirtualBrains that we have prepared for our customers: be able to identify people requesting support, identify people looking at the competition, identify people requesting a duplicate of a document, identify people who are complaining, identify people requesting a meeting, etc... All these specific use cases are using a dedicated VirtualBrain prepared to identify the meaning contained within unstructured text. If you have such a need, a specific VirtualBrain can be prepared for your use case and Hector will take care of the rest.

Hector is using SmartNeurons

Hector is based on SmartNeurons. At Beamak, we think that to create a cognitive software, that information should be processed in a human way (natural way). The cognitive software architecture should be as close as possible to how neurons are processing chemical information. It took us one year of research in Neurosciences to collect all the information that are needed to create this functional software framework. We named it the SmartNeuron. Our cognitive engines are using this specific framework.
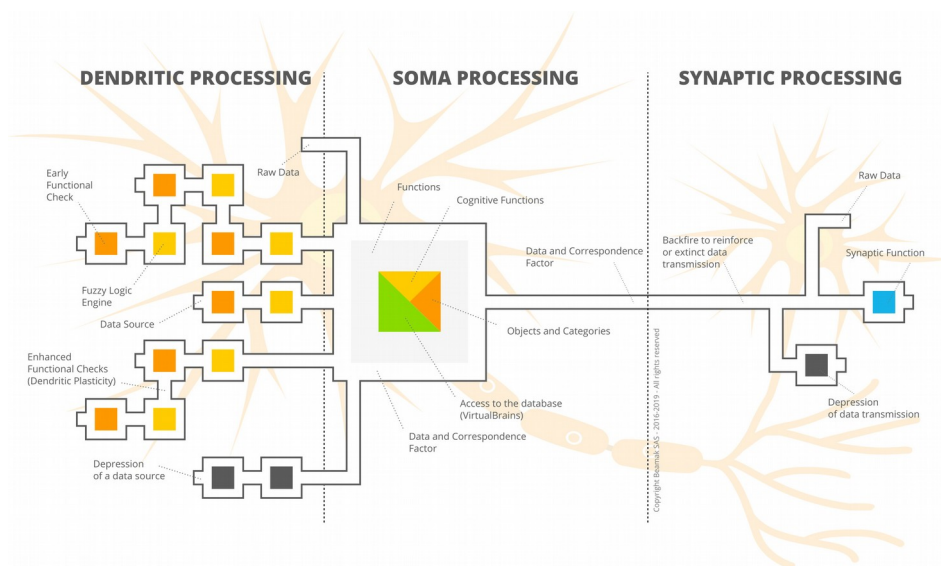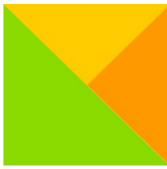
Hector is able to assess sentiments

Sentiment analysis is all about processing natural language to assess and identify affective states. Hector is using a knowledge-based technique which will classify the content of your verbatim by affect categories (positive or negative). We have assigned to each of these categories a list of related unambiguous words which have been taken from the latest clinical psychological researches. We added to each of these words their related semantic field to enhance the meaning recognition of those sentiments. The result is available within a specific VirtualBrain.

Additional information : The current measured recognition rate is 92%. The current VirtualBrain is made of 602 key terms which are linked to specific semantic fields for a total of 1734 different words (English version).

Hector is able to assess emotions

Emotion is a mental state which can be seen as the result of cognitive process. It is a positive or negative experience, producing different physiological, behavioral and cognitive changes. The role of emotions is to motivate adaptive behaviors. Hector is able to assess emotions using a knowledge-based technique in order to identify and classify eight primary emotions which are joy, sadness, anger, fear, trust, disgust, surprise and anticipation. Those primary emotions are then linked together, are influencing each other, and those associations will form a set of more complex emotions. In total, 32 emotions can be identified by Hector. Identified emotions can then be used as an essential input to other cognitive processes such as reasoning, decision making or problem solving, to adapt, alter or influence the response of the whole artificial intelligent system.

Additional information : The current measured recognition rate is 94%. The current VirtualBrain is made of 159 key terms which are linked to specific semantic fields for a total of 887 different words (English version).

Hector is able to assess human needs

Everyone has a set of universal basic needs (about 40), with individual differences on these needs leading to the uniqueness of personality through varying dispositional tendencies for each need, creating an internal state of disequilibrium; the individual is then driven to engage in some sort of behavior to reduce the tension. This is the moment when needs become active and this is what Hector is identifying. Hector is able to understand in "real-time" a given situation and find the set of active needs to be satisfied.

Additional information : The current measured recognition rate is 91%. The current VirtualBrain is made of 291 key terms which are linked to specific semantic fields for a total of 1419 different words (English version).

Hector's main features & technical requirements

Hector is a subscription-based software service. With one license, you can install Hector on an unlimited amount of servers, either on your premises or in the Cloud. It can be used by an unlimited amount of users to perform an unlimited amount of assessments. You have the freedom to adapt Hector's usage to your exact needs. Updates and upgrades are provided for free. Another thing that is interesting. All our competitors will adapt their price to the amount of characters that are contained within your verbatim. We think that this should not be like this and you can assess any verbatim (unstructured text data) of any size for the exact same price. To help you, we will provide you with an installation and a user manual. A standard support is also included in case you would have questions. Last but not least, we would like to inform you that Hector is not linked to any third party software and does not require any machine learning in order to be executed. In general, you can install and setup Hector within 10 minutes.

Hector can be installed on any server running Ubuntu 18.04 LTS 64 bits, having 1 available core, 2 GB of available RAM and 100 MB of free disk space. If you have a different Linux Operating System, we can provide you with binaries compiled for your server (additional professional services).

The table below will provide you with additional information about similar services available.

	Amazon	Google	IBM	Microsoft	Beamak
Description					
Sentiment Analysis	✔	✔	✔	✔	✔
Emotions Analysis	✘	✘	✘	✘	✔
Human needs assessment	✘	✘	✘	✘	✔
Meaning recognition (use case)	✘	✘	✘	✘	✔
Licensing					
Subscription based	✔	✔	✔	✔	✔
Unlimited amount of servers	✘	✘	✘	✘	✔
Unlimited amount of users	✘	✘	✘	✘	✔
Unlimited service calls	✘	✘	✘	✘	✔
Hosting					
Cloud	✔	✔	✔	✔	✔
On premises	✘	✘	✘	✘	✔
Content processing					
Amount of characters per unit	100	1000	10000	5000	Unlimited
Language detection	✔	✔	✔	✔	✔
Handling unstructured data	✔	✔	✔	✔	✔
Other features & benefits					
Installation and User Manual	✔	✔	✔	✔	✔
Free updates	✔	✔	✔	✔	✔
Free upgrades	✔	✔	✔	✔	✔
Standard support	✔	✔	✔	✔	✔

Some use cases

For one of the Big Four technology company, Beamak used Hector to assess human needs contained within buyers reviews to provide for each customer a better understanding of their needs (360° insight) and be able to compare the product description to how people saw it. This was done to help marketers to highlight the product benefits. Better knowing what customer needs is also a new

input which is used to change the selection of products presented to online customers when they search within the shop for a product, augmenting the user experience and satisfaction.

For an international Telecommunication company, serving 256 millions of customers worldwide, Beamak provided a specific VirtualBrain, used by Hector, to assess and understand the content of unstructured text, to detect sentiments, people who are seeking support and those looking at the competition. When detected, a context specific action is triggered by Hector. Most of the content is coming from social networks.

For an International Business Process Services company, operating in 11 countries, Beamak provided a specific VirtualBrain, used by Hector, to assess and understand the content of mails, tag them and assign them to the right service. Some examples describing how this specific VirtualBrain is used: taking care of people who wants to get a refund, people who need a duplicate of a document or people seeking support.

About Beamak

At Beamak, we do Cognitive Computing.

As cognitive scientists, we worked for more than 20 years for leading business & technology consulting companies helping clients on their digital transformation journey. With this unique knowledge in business process modernization, computer sciences, neurophysiology and cognitive psychology, we decided in 2016 to create Beamak with one intent: provide to businesses innovative Cognitive Computing software solutions and dedicated professional services.

Intelligence is a human thing. It can be defined by our ability to reason, make decisions and solve problems. These cognitive processes are linked to psychological features such as emotions, sentiments or needs. These mental states are providing additional context related key insights which once added to
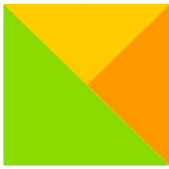
other available inputs will create a conglomerate of information, providing us with a mental representation of the situation, enabling our awareness and adapting our behaviors and actions.

Our recipe put these human things inside something immaterial, inside a machine so that this machine is able to think like a human. Knowing this recipe is empowering us to create and explain how to create Cognitive Computing software to help companies building their artificial intelligent solutions.

For these innovations, we have been among the 64 semi-finalists of the Let's Go France Trophee in 2019 (out of 465 companies) and were ranked #1 in terms of vote during the Artificial Intelligent contest organized by PwC and Slush in 2018.

In case you need additional information or have questions, please do not hesitate to contact us per e-mail at contact@beamak.com.

Best,

Béatrice & Mark