

# Climax: A historical script's AI transformation for human behavioural estimation

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**Abstract:** This article presents an AI pilot project, derived from and applied to a Christian cultural heritage text, called Climax. This book is characterized by unique value, dimension and tone from a psychological point of view. Indeed, it can be used as an exceptional tool for diagnosis, treatment, and prediction of individual behaviours, from both a psychological and a theological point of view. Within this framework, the initial goal of the project presented herein, is to explore specific capabilities provided by machine learning, with field of interest that of Climax while focusing research on the area of supervised learning. In this way, a route is opened in behavioural research, and especially in the field of personality behaviour. According to the text under consideration, all human mental states result from a dipole of behaviour, which is summarized in: *passions vs virtues*; a negative value is given to the first category of behaviour (passions), while a positive value is given to the latter (virtues). The ascent of people to higher spiritual levels presupposes the cultivation of virtues and the healing of passions, while in turn these actions allow for a peaceful earthly life. Conversely, the descent of people to lower spiritual levels comes by the development of passions and the elimination of virtues, which leads to pathological states.

**Keywords:** *Artificial Intelligence—Historical Script—Human Behavioural Estimation*

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## Introduction

Today, applications of Artificial Intelligence (AI) are increasingly used in industry (Lee et al., 2018; Parunak, 1996), in companies (Machová and Vochozka, 2019; Sterne, 2017) and other areas e.g. in museums (Burgard et al., 1999; Villaespesa and Murphy, 2021), in medicine (Chiang and Dey, 2018; Hamet and Tremblay, 2017; Ramesh et al., 2004), in education (McArthur et al., 2005). It is well known that one tool of AI is machine learning (Bernard, 2021), that is the way through which a computer system (machine) can acquire intelligence. In other words, AI as science seeks to make machines acquire a basic human ability, the ability to understand and learn things, to become intelligent systems (Negnevitsky, 2005). This ability is achieved through three ways of learning: supervised learning, unsupervised learning, and reinforcement learning (Bernard, 2021). A basic goal of machine learning, then, is to create automated services for understanding a dataset, so that those services can be used to solve different problems that require intelligence. Some of these are problems: classification, prediction, association analysis, clustering, pattern recognition, planning, etc.

(Bernard, 2021). The first step required is learning, i.e. computer systems learn from data, specifically through their descriptive features. The next step is to enable systems to make decisions by observing situations –just like humans do– without being explicitly programmed to do so.

Taking into account all these possibilities of machine learning, an AI project is proposed here. More specifically, this is a cultural heritage project involving the elaboration of a Christian text, which at the same time, in addition to being a theological text, can also be described as a psychology textbook, or more precisely as a “manual” for diagnosing, treating and predicting individual behaviors. That is, the text is related to the field of personality psychology (Pervin, 2003), but also the field of behaviour change (Bellg et al., 2004; Moncher and Prinz, 1991). Besides, their integration with the field of informatics gives new opportunities in behaviour research, but also in the organization of knowledge about human behaviour (Spruijt-Metz et al., 2015).

The text being studied is therefore called the “Climax”; it is a text that provides an empirical model for the development of the human personality, which is structured in steps of the scale, that those who follow them will pass from the lowest to the highest levels of the spiritual ascent of the soul. The model, therefore, is based on a theological point of view, in fact quite ascetic, which does not necessarily coincide in all its points with the secular conception. In other words, Climax proposes its value system, through which it looks to the prospect of the salvation of the soul. Salvation leads to an earthly bliss, earthly happiness, which every human being undoubtedly seeks in every age. In turn, this earthly bliss leads to future heavenly glory. But let us look in more detail at some useful facts about this Christian text.

### **Climax’s structure**

There is a historical script in the Christian Literature, written in the first period of unified Christianity, which could be considered as the primary theological text, in value and uniqueness, after the Bible. The title of this script is ‘Climax’ (= the Ladder) and it was written by St. John of Sinai (or, Climacus). This text was written in the 6<sup>th</sup> century AD. in the Greek language of that period, following a long period (ca. 40 years) of St. John’s rigorous ascetic life on Mount Sinai. The script is an offspring of the empirical progress of St. John in spiritual perfection in Christ. It is undoubtedly an entity of world cultural heritage. The aforementioned book ‘Climax’ is thus important for the Christian Church that one Sunday each year has been dedicated to it, a dedication which is maintained until today, e.g. in the Orthodox Church. It should be noted that ‘First, the Ladder was written specifically for monks in a cenobium. And, second, the work is relevant to laypeople, too’ (Chryssavgis, 2004, p. 23).

The text is structured in 30 chapters – the 30 steps of the Ladder – which are the steps of man’s ascent to spiritual (in Christ) perfection; this perfection is achieved with the virtue of love (30<sup>th</sup> step). One of the proposed segmentations regarding the organisation of the text is given as (Climacus, 1982, pp. 11–12): (i) ‘The Break with the World’ (Step 1–3) (ii) ‘The Practice of the Virtues-Active Life’ (Step 4–26) (iii) ‘Union with God-Contemplative Life’ (Step 27–30). In addition to the previous general structure of the overall book, there is an internal structure per chapter that includes: introduction, definitions, presentation of the subject under examination, and conclusions (Chryssavgis, 2004). The virtues and passions of man coexist in the work; each person should follow virtues and should avoid passions. It is obvious throughout the text that two opposite poles are dominant, the virtues and the passions, which are the fundamental entities of human behaviour.

The text has its inherent and even unique logic, as well as a related exceptional intelligence. For example, the behavioural entities (passions/virtues) that are presented in the text of Climax are very well delimited, with specific properties, positions, and relationships (of hierarchy, inheritance, causality, etc.). The latter effortlessly provides the opportunity to move to the level of Artificial Intelligence (AI). Therefore, adapting the content of the text to an AI format is not just a challenge, it is a must. Furthermore, what is definitely the primary application of Climax in (real-time) applications draws from its unique advantage that is to provide interconnections among individual components of human personality, and therefore of behaviour, i.e. virtues and passions; moreover, to provide the logical path of their evolution, as well as of human behaviour. Therefore, a robust estimation of human behaviour results.

## Method

It is obvious that machine learning provides a wide range of advanced capabilities. However, the article at hand focuses on supervised learning, which is one of the ways in which machines learn. In this case, computer systems accept input data (A) and their corresponding output data (B). The *A to B* type of learning, i.e., input to output mappings, is the most common method in machine learning. Paradigms of this type of learning are online advertising and machine translation. For instance, in the first paradigm, information about potential customers (e.g. age, place, interests, selection of previous advertisements) and advertisements (e.g. advertisement type, advertisement product) are the input and output data. Therefore, the data feeding of an AI system is a very crucial factor for its advanced function. In other words, the dataset is a critical factor in achieving machine learning, while moreover, the more data fed to it the better prediction is achieved.

Consequently, understanding data that will be used in machine learning is a critical task, while the abundance of data significantly affects the whole learning task too. In the next paragraphs the types of data which can be mined from the Climax's text is presented as well as their nature and their amount. In more detail:

### *(1) types of data*

Climax's text describes different somatic and psychic conditions in which a person may find himself. These conditions reflect specific behaviors, which can be distinguished into two broader behavioral entities, passions and virtues. In the text, passion (πάθος/ πάθος /) is considered to be a negative state (thought/ feeling/ desire or action), which is so strong that it wins over logic and determines the general patterns of man's behavior. A behavior, however, that goes away from the goal of (eternal) salvation of man. On the other hand, virtue (αρετή/ areté is considered to be a positive state (thought/ feeling/ desire or action), which leads to the (eternal) salvation of man. Moreover, the snapshots of behavioral entities (e.g. mourning, untimely jesting, love, hate) -as already mentioned- have specific properties, positions, and relationships. Indeed, the following aspects can be found in the text:

*(a) definition of snapshots.* The following excerpt of the text is here as an example: "Mourning is the characteristic sorrow of a penitent soul who adds sorrow to sorrow" (Climacus, 1982, p. 43). This definition makes feasible the determination of fundamental characteristics connected to this specific behavior snapshot, i.e. its description.

*(b) positions of the snapshots.* It is observed for example, that each specific passion or virtue leads to (generates) other passions or virtues respectively. This creates a chain of passions or virtues,

where each snapshot of behavior has a definite position. For instance, gluttony precedes lust in the chain of passions' occurrence.

(c) *interconnections among snapshots*. There are at least three fundamental interconnections among snapshots: *relationship of transition* (e.g. gluttony gives birth to lust, which in turn gives birth to untimely jesting), *relationship of opposition* (hate vs love) and *relationship of hierarchy* (there are eight fundamental passions that give birth to the rest passions). It should also be noted that, throughout the text, the sequential and dependent interrelationships of passions and virtues are apparent.

### (2) *data nature*

Climax's text consists of unstructured data, although there is a logical structure in the way the data related to human behaviour are presented (e.g. path of evolution). However, the unstructured data are not systematically documented and accumulated into appropriately structured data structures.

### (3) *amount of data*

The text is characterized by a very dense meaning; thus the information that refers to mental states is abundant. The latter can easily be understood, given that the overall content of the Climax book in English, i.e. 'The ladder of divine ascent' extends to 129 pages (Climacus, 1982). Indeed, as will be seen in the following application scenario (see Figure 3), 23 passions and 31 relationships have been identified on a single page. It can therefore be estimated how large will be the total amount of data regarding the whole text. The critical conclusion is therefore that the amount of data that can be extracted from the text is very large, and thus it is undoubtedly enough to train the computer system.

In addition, the snapshots of the couple of behavioral entities it is possible to be organized into three parts based on the three-part division of the soul –which appears already from antiquity in the teaching of Plato, known as *Plato's Tripartite Soul Theory* (Fancher, 1996)– since, according to Christian teaching, soul is the seat of personality (see for instance: homilies of elder Athanasios<sup>1</sup>). These three parts are intellect, reason, and spirit. The first part concerns speech and thought, the second refers to emotion and the third one concerns desires which are so strong and lead to action. Finally, the collection of data is implemented by manual labeling, which is a de facto and tried way to acquire a dataset in order to create a behaviour 'detector'. Thus, in as much as AI is able to analyze complex data, then, it can be used, in this project, to diagnose, treat and predict human behaviors, as will be briefly shown in the next section.

## **AI estimation of human behaviour via Climax**

At a practical level, the algorithmisation of the production of behavioural knowledge presupposes the transcription, coding, and storage of the empirical data of Climax in computer systems. Thus an 'intelligent' tool can be created for understanding people's actions, which is able to "predict" and "explain" their behaviour. Two approaches seem possible: on the one hand, a knowledge base can be constructed, which will "estimate" behaviour based on what he knows, while on the other hand, a learning machine can be constructed which will "explain" behaviours based on the creation of new data structures, namely, new mental patterns.

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<sup>1</sup> <http://www.saintnicodemos.com/articles/athanasios.php>

In this context a class called 'soul' can be created, which contains the three fundamental powers/parts of the soul, according to Christian teaching (St. Gregory Palamas), namely, nous, logos. and pneuma (intellect, reason, and spirit). The subclasses (i.e. virtue and passion) inherit all the attributes from the parent class 'soul'; however, the subclasses possess their own specific attributes. These attributes are their name, their product and their order (which is a number that indicates the number of products that a virtue or a passion produces) (see Fig 1.). An identification number is also defined for each path in the complexity diagram, which is characterised as 'id-path'.

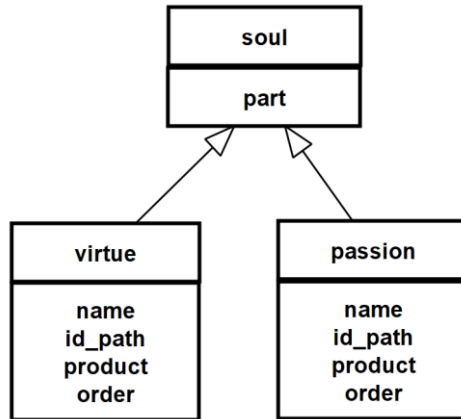


Fig. 1. Inheritance diagram of Climax © Authors

Moreover, there is additionally the possibility of knowledge representation in order to extract and display the relationships between virtues and passions; the latter representation leads to respective complexity diagrams (Myridis, 2020) as a skeleton/spine on which the whole work is built. The behavioural entities (virtues, passions) are the nodes of complexity diagrams, while the edges in these diagrams are the interconnections among the entities. Two typical examples of complexity diagrams in Climax are given below.

In Figure 2 a snapshot is schematically rendered regarding the relationship diagram of the passion of avarice. More precisely, this figure highlights a path of evolution of the avarice passion. It follows from this graph that the products of avarice are anger and effort while it is itself a product of the passion of unbelief.

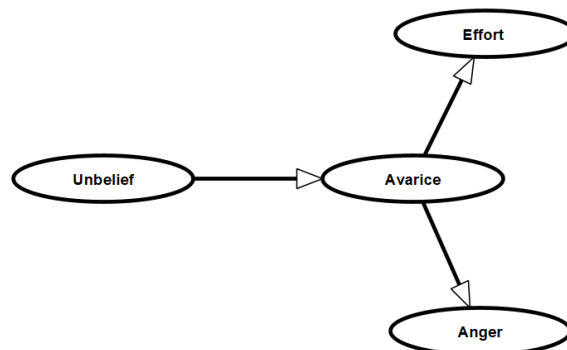


Fig. 2. A path of evolution (snapshot) of the passion of avarice © Authors

In Figure 3 another snapshot is depicted displaying the products of avarice which are: hatred, thefts, envy, separations, enmities, storms, remembrance of wrong, hard-heartedness, murders.

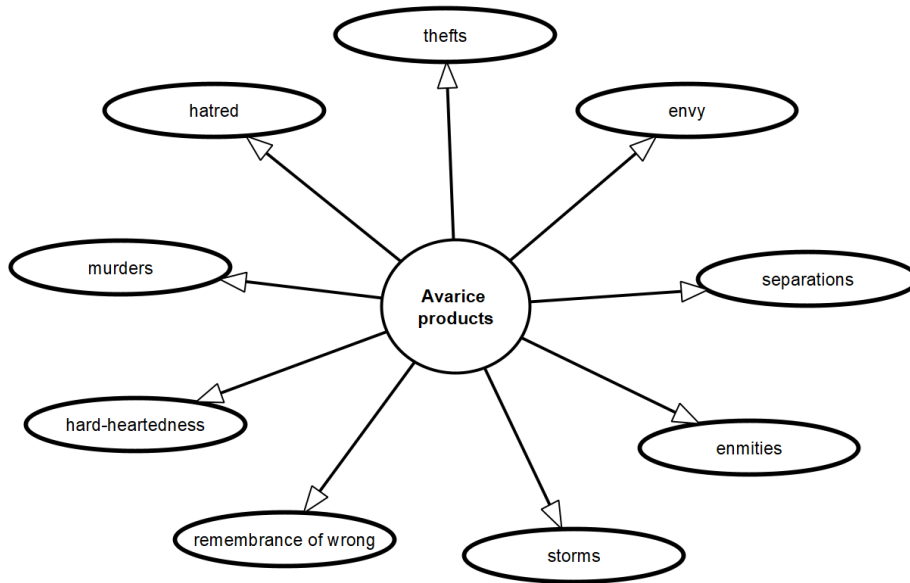


Fig. 3. The products of avarice © Authors

It is obvious therefore that a set of examples of behaviours can be extracted from the text, which ones are marked as positive or negative. These examples are then classified into categories which have specific characteristics. When structured data have been created, a prediction can be made: an unknown behavior can be classified into a specific category (output data), based on the description of all behaviors (input data), i.e. it can be decided whether it is a passion or a virtue.

It is also possible, for example, to identify the chain of relationships that intercorrelate passions. The text of Climax reveals that a behavior A generates another behavior B. Therefore, an AI system can be trained to decide which one is the input and which one is the output. A characteristic example of representation of negative behaviors (passions) sequences is shown in Figure 4. Some passions are fundamental (e.g. despondency, vainglory, and gluttony) and others are non-fundamental (e.g. conceit, dejection, despondency). It is also observed that some relationships among passions are stronger. This means that, e.g. hardheartedness frequently is born of insensitivity.

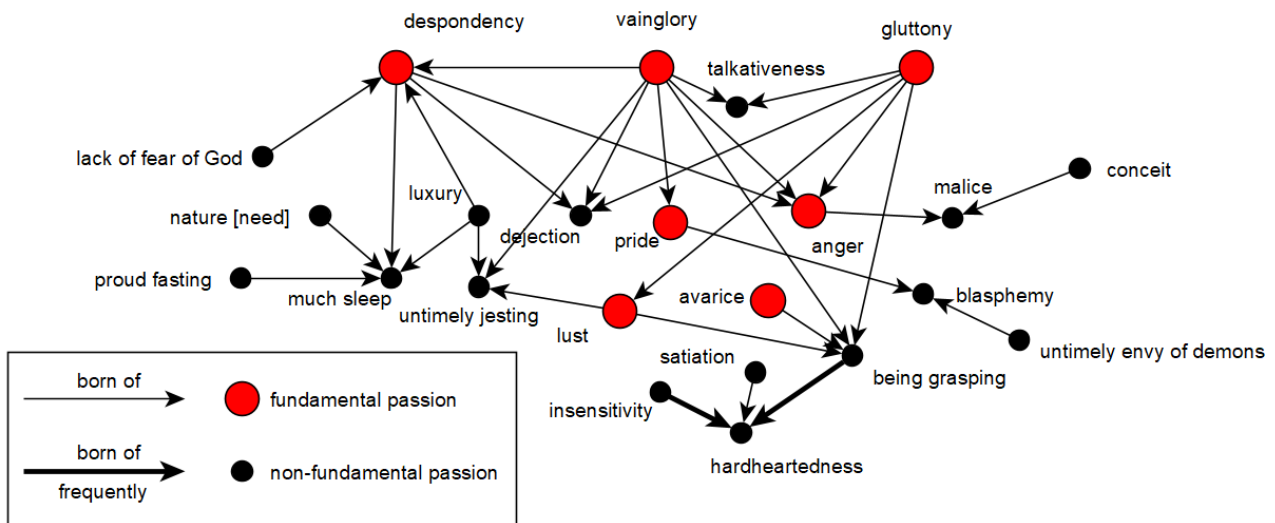


Fig. 4. Complexity diagram of passions © Authors

In this context, a group of people (e.g. psychologists, spiritual fathers) can study the behaviors of individuals and be able to discover the main cause of a passion. In fact, the cause sought obviously refers to another (radical) passion, which must be treated. Climax's text concludes that, in general, all passions can be healed directly by humiliation (!), a virtue which however is difficult to be realized. However, alternatively, there are also longer paths to eliminate passions via gradual progress in virtues.

## Conclusion

The usefulness of AI in the case of Climax is manifold and extends to a variety of areas of interest, e.g. psychology. The overall text, with its structure and development, as well as with the analysis of the psychological untrodden of human personality, provides a profile of the human soul and an approach to human behaviour. It also opens new horizons of research and challenges, such as for instance is the research focusing on the degree of Climax's approach to the real status of human character and behaviour. Both the revelation of aspects of human personality by terms, means and applications of AI, as well as the estimation or interpretation of behaviours, are innovative achievements provided in our time by a historical text of centuries, i.e. that of Climax. Moreover, there is of course the alternative way of implementing this project by using neural networks or deep learning algorithms.

Finally, it should be stated that the original text: (a) carries out an in-depth examination of behaviors; (b) demonstrates the unconscious interrelationships among behaviors, i.e. the interconnection of passions and/or virtues; (c) provides key answers to the challenges personality psychologists face; (d) grounds all the aforementioned onto salvage criteria, which not only concern a future (eternal) peace but also an earthly one.

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Authors have no conflict of interest to declare.

## Author Contributions

**Conceptualization, Project Administration, Supervision, Validation, Writing – review & editing:** Nikolaos Myridis

**Data curation, Investigation, Visualization:** Dimitra Sarakatsianou

**Formal Analysis, Writing – original draft, Methodology:** Nikolaos Myridis, Dimitra Sarakatsianou

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