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COMMENTARY

# Formation of Motivated Adaptive Artificial Intelligence for Digital Generation of Information and Technological Actions

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**Abstract:** Motivated artificial intelligence plays a relevant role in digital generation of information. Motivated artificial intelligence activates the generation of meanings and technological action. Its motivational functionality and motivation goals are determined by developers and users of technologies, which in turn helps to form AI motivation in the context of digital transformation. Formation of artificial intelligence motivation in digital generation of information is complex and multifaceted task that includes both theoretical and practical aspects of AI motivation in technological thinking and actions. Artificial motivated intelligence must have clearly defined goals that it must achieve. The goal of motivation can be set in the form of functionality (ontology, erudition, reflection, usefulness, preference), which will guide the motivation of AI. The use of reinforcement learning methods will allow AI to independently find optimal strategies for achieving its goals. It receives positive or negative reinforcement depending on how successfully it performs information transformation tasks. To form motivation of AI, it is necessary to ensure its ability to adapt to changing conditions and tasks. This includes learning from new data, knowledge and experiences. In some cases, it is useful to implement elements of emotional intelligence so that AI can better understand and respond to human emotions and actions. This improves the digital generation of information. It is important to consider ethical aspects and security. It is necessary to ensure that the digital generation of information does not lead to undesirable consequences or harm. Artificial intelligence must be able to effectively interact with users and other systems to receive feedback and adjust its actions in accordance with changing conditions. Research and implementation of motivation models, such as the hierarchy of needs or self-determination, can be useful in international digital generation of information. Formation of AI motivation requires an interdisciplinary approach that includes psychology, computer science and ethics. Motivation of AI to advance scientific and technological achievements is relevant in digital generation of information in various fields of activity. The motivation of hybrid intelligent systems is realized on the basis of knowledge engineering through synergetic communication.

**Keywords:** artificial intelligence, human motivation, motivated AI, AI assistant

## 1 Introduction

The integration of knowledge engineering with machine learning offers a promising approach to the formation of motivated adaptive artificial intelligence. This integration combines the strengths of data-driven learning with formal, structured reasoning, allowing AI models to be both highly accurate and explainable. By leveraging structured knowledge, such as electronic health records in healthcare, scientific axioms, or legal guidelines, motivated AI systems gain the ability to perform common-sense reasoning, which increases their reliability and makes them more knowledge-aware. Their ability to provide verifiable, human-readable explanations makes them especially valuable in mission-critical domains. The focus is on developing hybrid human-motivated adaptive artificial intelligence systems with functionalities (ontology, erudition, reflexivity, utility, preference) that use multimodal approaches, incorporating various forms of data, including text, speech, images, and human-centric video.

Functionality (ontology, erudition, reflection, usefulness, preference) plays a unique role in the formation of motivated adaptive artificial intelligence and its relationship with other aspects of intellectual activity. Ontology is a structure representing knowledge in a certain area. It includes definitions of entities, their properties and relationships. Ontologies help

to structure information. Creating a clear knowledge model allows artificial intelligence to better understand the context and relationships between different concepts. Ontologies improve semantic search and the quality of information retrieval, allowing the system to better understand user requests. Ontologies allow different systems to exchange and use knowledge, which is especially important in complex ecosystems. Erudition represents extensive knowledge in various fields. An AI with erudition can integrate knowledge from different fields and apply it in new contexts. An erudition-rich AI is able to provide more accurate and meaningful answers to complex questions. Erudition allows an AI to solve problems using a combination of knowledge from different fields, which facilitates innovation.

Reflection is the ability of an AI to analyze its own actions and results. An AI can evaluate its previous decisions and learn from mistakes to improve future results. Reflection helps an AI adapt its algorithms and approaches based on the experience gained. Reflection of an AI helps optimize its processes and increase efficiency. Utility is the ability of an intelligent system to benefit the user in solving specific problems, assessing desired results, optimizing solutions in terms of time and resource costs, and adapting to changing user needs and preferences. Preference is associated with choosing between different options or actions. Artificial intelligence tracks and analyzes user preferences to provide personalized recommendations. Artificial intelligence makes decisions based on utility assessments of different options. Preferences determine the formation of goals and action strategies in different situations.

The relationship between ontology, erudition, reflection, utility, and preference forms the basis for a motivated and adaptive intelligent system. Motivated adaptive artificial intelligence helps to effectively process information, learn from experience make informed decisions, which determines its compatibility in various areas of human activity.

## 2 Aspects of Human Motivation

Human motivation is a complex and multifaceted process that is determined by many factors. The main aspects of human motivation can be divided into several categories:

(1) Intrinsic motivation comes from within a person, based on personal interests.

(2) Physical condition significantly affects motivation.

(3) Personal values and beliefs of a person shape his motivation.

(4) Clearly defined and achievable goals increase the level of motivation.

(5) Confidence in one's own strengths and abilities to achieve goals plays an important role in motivation.

(6) Emotions play a key role in motivation. Positive emotions, such as joy or satisfaction, can increase motivation, while negative emotions, such as fear or stress, can decrease it.

(7) Extrinsic motivation is caused by external factors.

(8) Social support from family, friends, and colleagues significantly increases motivation.

(9) Comparing yourself to others can both increase and decrease motivation.

(10) Cultural norms and values influence what motivates people.

(11) Economic conditions influence motivation by limiting or expanding opportunities for self-development.

Understanding these aspects of motivation helps both in personal life and in managing people, as it allows you to identify and use factors that contribute to increasing motivation and achieving goals. Motivation occurs as a result of the interaction of various internal and external factors. Let's consider the elements and stages that contribute to the emergence of motivation. The elements of human motivation include key components: needs, goals, expectations, emotions, personal meaning, experience and learning. Each of these elements can interact with each other, creating a unique motivational system for each person.

Motivation often begins with the awareness of needs or desires. These can be basic physiological needs (food, safety) or more complex ones, such as the need for recognition, socialization or self-actualization. When a person is aware of their needs, they begin to formulate goals that can help them satisfy them. Clear and specific goals serve as a source of motivation, directing efforts to achieve the desired result. An individual evaluates his or her chances of success in achieving the set goals. If he or she believes that his or her efforts will lead to the desired result, this increases motivation. The belief that the goal is achievable is an important factor.

A person's emotional state also plays a significant role. Positive emotions such as joy and inspiration can help increase motivation, while negative emotions such as fear or doubt can decrease it. External stimuli such as rewards, incentives, support from others, and the social environment can significantly affect the level of motivation. For example, positive feedback

or recognition of success can strengthen the desire to act. Motivation also arises from how important a task or goal is to a person. If a person believes that achieving a goal is important to his or her life or values, this increases his or her motivation.

Previous experience also influences motivation. Successful experiences can increase confidence and desire to continue striving for a goal, while failures can have a depressing effect. The process of human motivation is a complex and multifaceted mechanism that includes many factors that influence the behavior and actions of an individual. The motivation process is dynamic and can change depending on situations, personal circumstances, and changes in a person's life.

# 3 Human Motivation of Artificial Intelligence

Human motivation of artificial intelligence is the process by which humans define goals and objectives for intelligent systems and set the parameters within which these systems must operate.

Experts formulate specific goals and objectives that artificial intelligence must achieve [1]. This could be process automation, data analysis, decision-making assistance, and so on. Clearly defining goals allows artificial intelligence to perform its tasks more effectively. Experts set parameters that limit the actions of artificial intelligence in accordance with moral and social principles. This includes ensuring safety.

Developers provide feedback to artificial intelligence, allowing it to learn and adapt. This includes adjusting algorithms based on the results of the system's work and user feedback. Thus, artificial intelligence becomes more accurate and effective in achieving its goals. Motivating artificial intelligence also involves understanding the context in which it operates. Developers train and consider social, cultural, and economic factors to ensure that its actions are appropriate and relevant. Developers require that artificial intelligence be transparent in its actions. This includes explaining the decisions it makes so that users can understand the logic behind its actions. This is important for establishing trust in intelligent technologies.

Professionals provide control over intelligent systems by setting boundaries and limitations in their functioning. This is important to prevent possible negative consequences and ensure that intelligent technologies are useful to humans and society. Motivating artificial intelligence by humans is a complex process that requires active participation, responsibility, and understanding from developers and users of technologies.

# 4 Ontological, Erudite, Reflexive, Useful, Preferential and Meaningful Motivation of Artificial Intelligence

We will consider the motivation of artificial intelligence from various points of view, including ontological, erudite, reflexive, useful, preferential and meaningful. Ontological motivation is related to the essence and nature of artificial intelligence [2]. It includes an understanding of what artificial intelligence is, how it functions, and what its capabilities and limitations are. This understanding forms the basis for the development and application of artificial intelligence, as well as for forming expectations for its work. Ontological motivation addresses issues of identity, consciousness, and the ability of artificial intelligence to be self-aware.

Erudite motivation is based on the knowledge and information that artificial intelligence can use to perform its tasks [3]. This motivation implies that artificial intelligence must be able to process, analyze, and interpret data in order to make informed decisions. The more data and knowledge available to artificial intelligence, the more effectively it can act and adapt to different situations. Reflective motivation implies the ability of artificial intelligence to self-reflect and analyze its actions and decisions [4–6]. This includes evaluating its results and adjusting its behavior based on the experience gained. Reflexive motivation allows artificial intelligence to learn from its mistakes and improve its algorithms, which in turn increases its efficiency and reliability.

Utility motivation focuses on the practical application of AI to solve specific problems and improve people's lives. This may include automating processes, improving access to information, optimizing resources, and creating new opportunities. Utility motivation implies that AI should behave in a way that brings real benefits to users and society as a whole. Preference motivation concerns how AI can take into account the preferences and desires of users when making decisions. This includes customizing AI so that it can adapt its actions to individual needs

and preferences of people. Preference motivation allows for more personalized and targeted solutions, which increases user satisfaction.

Meaningful motivation of AI includes understanding the context and values that should be taken into account in the decision-making process. Artificial intelligence should take into account the context in which it operates. This may include cultural, social, and economic factors that influence decision-making. The aspects of AI motivation discussed above highlight the relevance of an integrated approach to its development and application. Understanding these motivations can help developers and researchers create more efficient and ethical intelligent systems that benefit society and take into account the interests of users.

# 5 Artificial Intelligence Motivation Technologies

We will also consider artificial intelligence motivation technologies in the context of creating systems that can effectively achieve given goals and optimize their actions. The following key technologies and approaches are related to artificial intelligence motivation. In this approach, the agent learns to interact with the environment, receiving rewards or penalties for its actions. The goal of an intelligent assistant is motivation based on external rewards.

Goal programming of motivation to perform specific tasks or achieve specific goals. Developers set goals, and algorithms adapt to achieve them efficiently. Evolutionary algorithms are motivated by the principles of natural selection to optimize solutions. Populations of possible solutions are created, which are subject to mutation and selection, which allows finding optimal solutions to complex problems. Iterative learning methods motivate artificial intelligence to improve itself by analyzing its previous decisions and adjusting its actions based on the experience gained.

Generative models, such as GAN (Generative Adversarial Networks), are motivated to create new data or solutions, which can be seen as a form of motivation to generate better results. Adaptive systems are motivated to change their parameters depending on environmental conditions, which allows them to more effectively achieve goals in changing conditions. Multi-agent systems are motivated to coordinate and interact between agents to achieve common goals.

Deep learning neural networks are motivated to analyze large amounts of data and identify patterns, which helps artificial intelligence adapt and improve its actions. Creating motivated AI assistants with Cursor IT vibe coding based on GigaChat and Deep Research. A special AI vibe coding tool Cursor has appeared, which helps to program without writing manual code. The developer from OpenAI notes that Cursor suggests in advance what it wants to write. The Cursor AI assistant has greatly advanced the process of creating AI assistants using vibe coding in Cursor.

Based on GigaChat, using Cursor, you can assemble AI assistants for a digital clinic that answer questions and guide the client without manually writing code. In 2025, a standard will be introduced in Russia: *Artificial Intelligence Systems in Healthcare*. The standard allows intelligent systems to perform most healthcare competencies: management and marketing, regulatory decision-making, clinical recommendations, patient routing, medical knowledge engineering, accounting and finance, personnel, design and processing of diagnostic images of ultrasound - X-ray and others, organizing communications between doctors and with patients, and so on. The introduction of intelligent systems contributes to the development of the entire healthcare system, including clinical practice, management, morbidity monitoring, epidemiological surveillance, etc., thus affecting all participants in the healthcare system, including patients [7, 8]. Interdisciplinary competencies in managing the implementation of artificial intelligence systems in healthcare will contribute to the improvement of clinical medical treatment practice and the healthcare system as a whole.

Principal researcher Jakub Pahotsky of the OpenAI development department, the developer of Deep Research, taught the system to do, firstly, reviews of scientific literature on a given topic, secondly, write texts for research, thirdly, create program code, fourthly, analyze scientific materials and put forward hypotheses. He expands the functionality and motivates Deep Research with the help of the AI vibe coding tool Cursor, firstly, to write complex programs, secondly, to create hardware solutions, and thirdly, to conduct research in scientific fields using models for generating new knowledge. Minimizing the risks of autonomous intelligence requires a digital transformation of standardization. Motivated adaptable artificial intelligence in the international digital transformation of standardization will combine new advanced intelligent technologies in various areas of human activity [9].

# 6 AI Engineer Developer of Motivated AI

Swix highlights the special role of AI engineers as developers who create and adapt neural networks to create motivated AI assistants. This process with additional tools:

(1) LLM (Large Language Models): language models, such as GPT-4 chat, which allow the neural network to understand and generate text.

(2) Memory: the ability of AI to remember the context of a dialogue in order to use knowledge from past experience.

(3) Planning: the ability of a neural network for programming to break tasks into stages, as well as perform them sequentially.

(4) Tools: integration with browsers, code interpreters or other external services. These technologies allow AI assistants to answer questions and perform complex multi-stage tasks.

These technologies enable motivated AI assistants to answer questions and perform complex multi-step tasks. Swix identifies several important components for creating motivated AI assistants:

(1) Gateway solutions, RAG frameworks – systems for working with external knowledge bases.

(2) Vector DBs, graph knowledge bases – allow artificial intelligence to store information and also learn from past data.

(3) Code execution environments (sandbox) – for example, E2B, where AI can test its code.

(4) Browser control and internet search – for example, the ability to visit websites and analyze information.

(5) Self-checking cycles (Self-Ask, React) – AI learns to make decisions based on previous results.

These tools form the basis for creating advanced solutions. An AI engineer can start creating motivated AI assistants without being a PhD researcher. To do this, it is enough to understand the basic stack of technologies and learn how to combine them correctly. We are on the threshold of a new era when code can be written by voice, when motivated AI assistants can develop complex software and engineering without human participation.

## 6.1 Data Quality and Preparation

Data quality and preparation are key steps for successful problem solving with an AI assistant. Proper data preparation ensures high accuracy, reliability, and efficiency of the model. It is necessary to consider the main aspects related to data quality and preparation.

(1) Data quality assessment:

• Completeness: availability of all necessary data for training and testing.

• Accuracy: correctness and reliability of data.

• Consistency: absence of inconsistencies within the data.

• Relevance: timeliness and relevance of data.

• Absence of missing values and errors.

(2) Data collection:

• Use of reliable sources.

• Ensuring data diversity to model different scenarios.

(3) Data cleaning:

• Removal of duplicates.

• Handling of missing values (e.g. filling with mean, median, or deletion).

• Correction of input errors.

• Standardization of data formats.

(4) Data transformation:

• Scaling and normalization (e.g. Min-Max, Z-score).

• Encoding of categorical variables (e.g. one-hot encoding).

• Splitting data into training, testing, and validation sets.

(5) Data augmentation:

• Creating additional data to increase the volume and improve the robustness of the model (especially important in computer vision and natural language processing tasks).

(6) Data analysis:

• Visualization and detection of correlations.

• Detection of outliers and anomalies.

(7) Documentation and data management:

• Maintaining metadata.

• Ensuring reproducibility of experiments.

(8) Ensuring ethics and privacy:
• Anonymization of personal data.
• Compliance with regulatory requirements for data processing.

It is important to remember that the quality of the data directly affects the results of the AI assistant. The better the data is prepared and verified, the higher the likelihood of obtaining accurate and reliable decisions.

## 6.2 Designing Supercomputer with an AI Assistant

Designing supercomputer with an AI assistant involves using artificial intelligence to automate the development, optimization of architecture, software, and management of computing systems. Here are the main areas and approaches to implementation.

(1) General concept:
• Design automation: the AI assistant analyzes requirements, explores existing architectures, and suggests optimal solutions.
• Self-learning and adaptation: the system learns from performance, energy consumption, and other metrics to improve its architecture and algorithms.
• Code generation: the AI assistant writes or improves the code of interpreters, operating systems, drivers, and software components.
(2) Implementation stages:
a) Analysis of requirements and goals:
• Definition of the tasks that the supercomputer should solve
• Setting performance criteria: speed, scalability, energy efficiency.
b) Architecture design:
• Using machine learning to find optimal configurations of processors, memory, network.
• Generating architectural diagrams taking into account parallelism, distributed computing, and resilience.
c) Training and optimization:
• Using reinforcement learning to tune system parameters.
• Simulations and modeling to evaluate performance and choose the best solutions.
d) Software generation:
• Creating interpreters, compilers, and operating systems using AI.
• Self-improving components that adapt to load and requirements.
e) Automation of testing and deployment:
• AI assistant automatically identifies bottlenecks and suggests fixes.
• Continuously training the system on new data.
(3) Technologies and tools:
• Machine learning and deep learning.
• Generative models (GPT, GANs, etc.) for generating code and architectural diagrams.
• Simulation platforms for testing proposed solutions.
• Cloud platforms and distributed systems for scaling.
(4) Example of a use case:
• An AI assistant is tasked with building a high-performance supercomputer for simulating physical processes.
• Analyzes existing architectures, collects metrics.
• Generates several architecture options, training them with simulations.
• Selects the most efficient option, writes the code for interpreters and drivers.
• The system continues to learn and optimize during operation.
(5) Important aspects:
• Security and control: it is necessary to monitor that the AI agent does not go beyond the limits of acceptable solutions.
• Ensuring transparency: it is important that AI decisions are explainable.
• Ethical and legal issues: the use of AI to design powerful systems must be accompanied by ethical standards.

# 7 Conclusion

Building motivated AI assistants using technologies like Cursor's Vibe Coding is essential to building modern, motivated intelligent systems. Motivated AI assistants can adapt to the needs and preferences of users, making interactions more natural and effective. Using Vibe Coding, you can create interfaces that take into account the emotional reactions of users, improving the overall user experience.

Motivated AI assistants can provide personalized recommendations and solutions. This is especially important in areas like e-commerce, where users expect systems to offer products and services that match their interests and needs. AI assistants built with Vibe Coding principles can learn from interactions with users, allowing them to develop and improve their skills. This creates a more dynamic and responsive environment where assistants can better understand the context and intent of users.

Motivated AI assistants can be developed with emotional intelligence, allowing them to recognize and respond to user emotions. This can increase user trust and satisfaction, especially in services that require a high degree of emotional interaction. AI assistants that understand user motivations and goals can more effectively help solve problems. This can be useful in business, education, and other areas where it is important to quickly find solutions and optimize processes.

The creation of motivated AI assistants also raises questions of ethics and responsibility for developers. It is important to consider how such systems can affect users and society as a whole, and to develop them with ethical norms and standards in mind. The creation of motivated AI assistants using Cursor's Vibe Coding opens up new horizons in the field of human-machine interaction. These technologies can significantly improve user experience, increase the efficiency and adaptability of systems, and contribute to a deeper understanding of user needs [10–12]. It is important to continue to explore these aspects in order to create research, safe and ethical AI solutions that will benefit humans and society.

The motivation of artificial intelligence for scientific research is based on its program goals, functionalities and learning systems. AI learns from large volumes of data, which motivates it to find new patterns and improve its models [11, 12]. Continuous self-learning and improvement of results serve as an internal motivating force for AI. AI reinforcement systems stimulate it to perform verified research actions, search for and develop new solutions. AI serves as a tool for accelerating scientific discoveries, analyzing complex data and modeling processes, which contributes to its motivation to develop knowledge and technology together with experts.

## Conflicts of interest

The author declares no conflict of interest.

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