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## FEATURES OF APPLICATION OF MACHINE LEARNING TOOLS FOR PSYCHOLOGICAL ASSESSMENT OF CHILDREN'S DRAWINGS

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The article presents an analysis of the features of the application of projective methods for testing the psychological state of children, as well as a pilot experiment on the implementation of machine learning tools for the psychological assessment of their drawings. These issues must be considered comprehensively, since most methods of psychological assessment and, in particular, projective technologies impose special requirements for reliability and validity, and also require special training and professional competence for their interpretation. The goal of the research project is to use digitized drawings created by internally displaced children of Nagorno-Karabakh as a tool to identify and assess their psychological state using machine learning methods. We believe that this approach can provide valuable insights into the mental well-being of children affected by the conflict and can serve as a diagnostic tool in times of economic and humanitarian crisis. The proposed feature extraction approach in psychological assessments identifies key visual elements such as object size, color, and spatial relationships that provide insight into emotional and cognitive states. Therefore, the application of machine learning techniques, and in particular feature extraction, classification, clustering, and the use of

large language models (LLMs), offers a transformative approach to the psychological assessment of children's drawings. Using neural networks (NNs) for feature extraction, these models can automatically detect important visual elements such as line intensity, shape proportions, color use, and symbolic objects. This automated extraction reduces the subjectivity and variability associated with traditional manual interpretation, improving the accuracy and scalability of assessments. Furthermore, classification and clustering algorithms provide structured ways to group children's drawings based on similar psychological themes, allowing for more objective analysis.

**Keywords:** *projective method, children's drawings, machine learning tools, large language models, neural networks, psychological assessment.*

**Introduction:** Over the past 30 years, scientific research approaches in psychological diagnostics have been associated with the "simplification" and "acceleration" of obtaining test results through the use of computing technology and digitalization. This trend is permanent, associated with the rapid development of computer technology, operational capabilities of programs and artificial intelligence. At a certain period, this process covered verbal tests and IQ tests, later moving on to projective diagnostics methods. These features of psychological assessment are clearly presented in publications on this topic [30].

These issues cannot be considered one-sidedly, since most methods of psychological assessment and, in particular, projective technologies have special requirements for reliability and validity, and require special training, i.e. professional competence in interpretation. Naturally, the mass character, accessibility, speed of implementation and reliability of processing, and the transition of these techniques to the online space raises many questions, especially ethical ones, which need to be studied and the methodology of computer diagnostics improved.

A historical excursion into the emergence and use of projective methods allows us to evaluate their significant contribution to the acquisition of information with their help both for psychological science and practice, which is associated with a deep understanding of personality. The diversity of projective tests, from the point of view of the methodology of psychological assessment of the structure and measured parameters, indicate that attention should be paid to a specific technique: drawing and childhood. A theoretical analysis of over 250 peer-reviewed articles (mostly from the last 3 years) identified the problem of considering projective tests in research with children. After an aggregated review, the author concluded that projective methods have empirical support for addressing such important clinical issues as the ability to reveal underlying psychodynamics, identify cognitive deficits, and differentiate specific diagnostic groups in children and pediatric populations [4].

An important element of psychological practice is the psychological report, the main purpose of which is to describe and interpret the information collected or discovered in the process of using psychological assessment tests. The authors rightly emphasize that many years of training in psychopathology, interviewing, interpreting psychometric tests, conceptualizing cases, and writing reports are necessary to learn how to interpret and report the results of psychological assessments in a clear, concise, and accurate manner. Lilienfeld, S. O. et al (2000) studied in detail the indicators norms, reliability, validity, incremental validity and treatment utility of three main projective tools (Rorschach and TAT tests and drawings of human figures) summarized the results of a meta-analysis aimed at studying the ability of the main tools of these methods to detect sexual child abuse. The results of this analysis concluded that although some projective instruments were better than chance in detecting child sexual abuse, there was virtually no repeatability of results among independent investigative groups [18].

The article is devoted to the analysis of Kelly's monograph "Psychological Assessment of Abused and Traumatized Children", which describes in detail and empirically confirms the original clinical paradigm for the application and interpretation of indicators of free personality reaction in children who have been abused. In addition to the Rorschach and TAT tests, other methods are added for the psychological assessment of these cases with children. From our point of view, such a universal approach is necessary in studies involving children, since the diversity of projective techniques contributes to the flexibility of diagnosis [32].

The features of psychological assessment of various traumatic effects, the main indicators and their consequences in children are considered in books and scientific articles, which emphasize the relevance of this problem in the context of the situation, the nature and frequency of negative influences, duration, the role of participation in adults and other factors [14].

The experience of using projective methods in research with children has a long history and different approaches depending on age, gender, situation, etc [11]. Analysis of such studies revealed the popularity of some methods of projective techniques, namely, verbal presentation, interpretation of images, associative reactions and, of course, interpretation of drawings [8].

Psychological assessment of children's drawings requires special training, i.e. knowledge of theoretical approaches, basic features, verbalization of symbols, since interpretation has similar difficulties associated with validity. At the same time, it is possible to emphasize the advantages of expressive methods, which are characterized by simplicity of implementation, economy and information content [2]. The authors of the studies emphasize that the specificity of children's drawings is characterized by freedom of self-expression, affective reactions, projection of the inner world, experiences, fears, personality patterns and feelings (Levin-Rozalis, Miri., 2006) [17].

Frequent reference to psychological assessment through children's drawings proves the informativeness of this approach, since this methodology is based on children's spontaneity, associative representations and expression of emotional, social, physical, educational and similar aspects [20]. However, it is important to note that many authors focus on the parameters of reading children's drawings and techniques for their psychological interpretation [1, 21].

Computational methods have gained prominence in psychological diagnostics, improving the speed and reliability of assessments [6, 31]. Children's drawings, traditionally analyzed through subjective projective techniques, are now prime candidates for automation using machine learning due to their time-consuming nature [26].

Advances in deep learning and NLP offer sophisticated tools for visual data analysis, making them applicable to psychological assessments. This paper explores the use of machine learning for analyzing children's drawings, focusing on feature extraction to detect visual patterns, classification and clustering to categorize psychological states, and using large language models (LLMs) to generate interpretable text from images.

Feature extraction in psychological assessments identifies key visual elements like object size, color, and spatial relationships, which offer insights into emotional and cognitive states. Neural networks (NNs), especially convolutional neural networks (CNNs), provide scalable, objective analysis by automating this process [27]. For example, Eitz et al. and Simo-Serra et al. demonstrated the effectiveness of NNs in object detection and feature extraction, which is crucial for assessing children's drawings [7, 28].

Classification models, such as support vector machines and random forests, are used to diagnose mental health conditions like depression by learning from labeled datasets [25]. Clustering, an unsupervised learning technique, identifies subgroups within disorders, providing insights into heterogeneous conditions like depression [5].

The integration of LLMs with vision models (e.g., CNNs, ViTs) enables automatic text generation from visual data, offering structured interpretations of children's drawings. Multimodal models like CLIP and BLIP align visual and language features, allowing for efficient, scalable psychological assessments. LLMs can describe emotional themes in drawings, such as "isolated figures with exaggerated emotions," aiding in quick and detailed analysis. However, challenges around accuracy, bias, and data privacy remain.

In conclusion, machine learning methods such as feature extraction, classification, clustering, and LLMs can enhance the objectivity and efficiency of psychological assessments, providing deeper insights into children's emotional and

cognitive states through their drawings. This paper outlines key methodologies for leveraging these technologies to improve diagnostic processes.

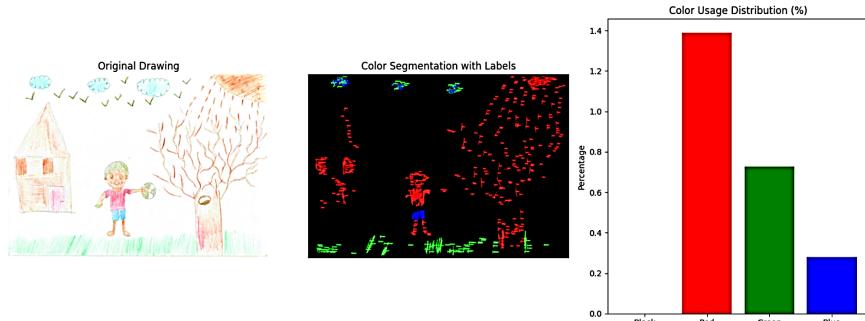
**Applying machine learning to the psychological assessment of children's drawings:** In this section, we outline a practical demonstration of how the methods described—feature extraction, classification, clustering, and large language models (LLMs)—can be applied to the psychological analysis of children's drawings. The following steps provide a clear framework for implementing these techniques in a real-world setting. The first step in analyzing children's drawings is to preprocess the images and extract important visual features. Using a Convolutional Neural Network (CNN), such as VGG16, ResNet, YOLO etc., we can automatically extract key features like objects, object shapes, spatial arrangements, and color usage. The pre-trained CNN is applied to extract meaningful features, such as objects, figure size, line intensity, and object positions, which can indicate underlying psychological conditions (e.g., anxiety, aggression). This automated extraction eliminates the subjective biases of manual analysis, offering a scalable approach to processing large datasets of children's drawings [27, 10, 24].

Now let's identify and present examples of the key features that can be extracted using computer vision techniques. As a baseline YOLO drawing dataset and 20 new real-world drawings from children (**Figure. 1**) will be used. For each case we will demonstrate the results of the feature extraction.



**Figure 1** Example of some new children's drawings from real life. These features are related to geometric, symbolic, and technical aspects of children's drawings, which can be relevant for psychological assessments:

**Color Usage:** Black and Red - Often associated with aggression, conflict, or heightened emotional states. Green and Blue - Linked to calmness, security, or contentment. NNs or color segmentation algorithms can analyze color usage and dominance in the drawing linking it to the child psychological state [12]. Example of color usage below:



**Figure 2.** Extracting and segmenting key colors from the child drawing

**Stroke and Shading Patterns:** Shading - Heavy shading may signify stress or anxiety. Hatching and Cross-hatching - Can indicate emotional tension, self-control, or frustration. Texture analysis [22] and NNs can detect shading patterns and hatching intensity, identifying areas of the drawing where emotional intensity may be reflected through shading techniques (example below).

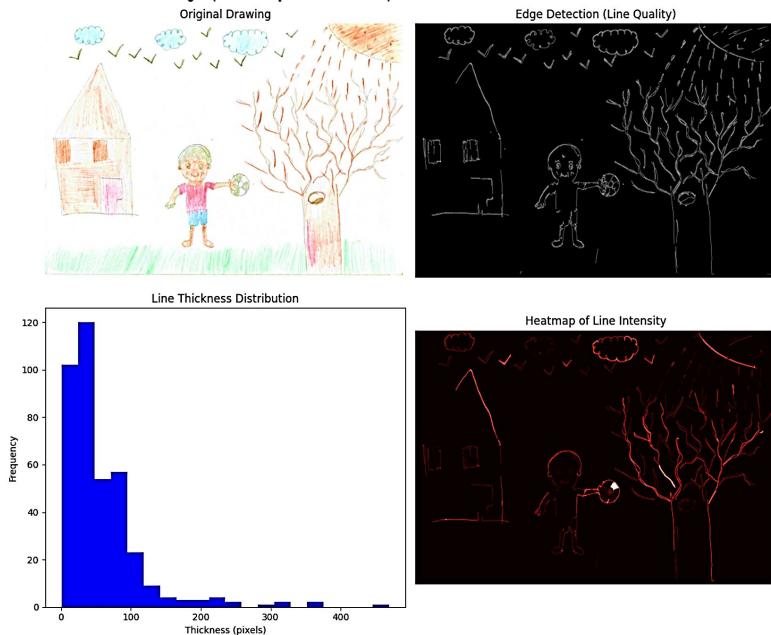


**Figure 3.** Extracting shading patterns and hatching intensity from the child drawing

**Line Quality and Intensity:** Thick Lines - Represents aggressiveness, ambition, or high energy.

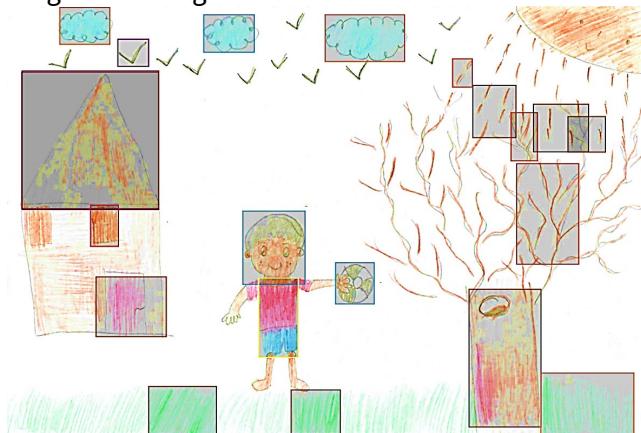
Thin or Soft Lines - Indicates uncertainty, fragility, indecisiveness, or low energy. Uneven or Broken Lines: Associated with emotional instability or

impulsiveness. NNs can analyze line thickness, detect breaks, and assess uniformity across the drawing [16]. The edge detection method can be used to quantify line sharpness and continuity (example below).



**Figure 4.** Extracting line quality and intensity from the child drawing

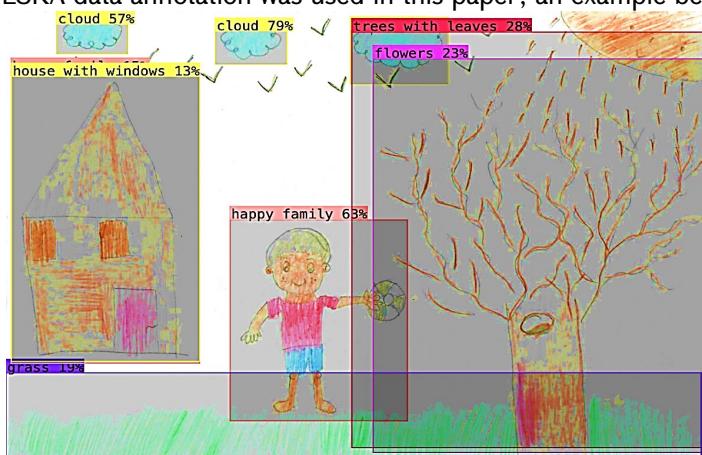
**Geometric Shapes:** Circles - Often represent completeness, unity, or self-centeredness. Squares and Rectangles - Linked to stability, discipline, or boundaries. Triangles - Can symbolize ambition or leadership. Object detection models like YOLO can be used to detect and classify geometric shapes in the drawing. Shape recognition algorithms would help in identifying these specific shapes and associating them with psychological meanings.



**Figure 5.** Extracting shapes from the child drawing

**Figure Size and Proportions:** Large Figures - Reflects self-confidence or ambition, possibly a compensatory behavior. Small Figures - Associated with discomfort, insecurity, or feelings of inferiority. NNs can measure the relative size of figures in comparison to the page and other objects in the drawing [19]. Bounding box algorithms can help in estimating figure sizes (example below).

**Object Detection (e.g., Sun, Trees, and Animals):** Sun or Stars - Often represent positive emotions or aspirations. Trees - Symbolize vitality, growth, or self-perception. Animals - May indicate feelings of fear, vulnerability, or aggression, depending on the type of animal and its posture. Using object detection models like YOLO8 [13], specific objects such as animals, trees, and celestial bodies can be identified and categorized based on their symbolic meanings. Specifically, YOLO8 with ESRA data annotation was used in this paper, an example below:



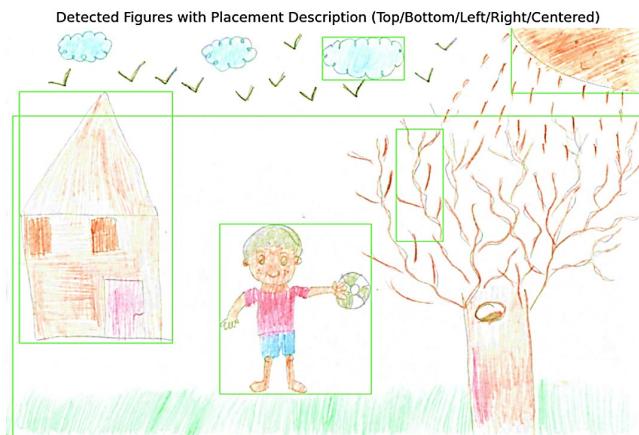
**Figure 6:** Extracting objects such as animals, trees etc. from the child drawing

**Figure Orientation and Placement:** Centered Figures - Indicates a balanced, confident self-perception. Figures at the Edges - Often reflect withdrawal or social anxiety. Figures Positioned High: Represents optimism or unrealistic aspirations. Spatial analysis tools within NNs or coordinate extraction can be used to determine the placement and orientation of key objects and figures in the drawing, relative to the center or edges of the page.

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Object detected at: Centered (Bounding Box Area: 372900)
Object detected at: Centered Right (Bounding Box Area: 75990)
Object detected at: Centered (Bounding Box Area: 2946226)
Object detected at: Left (Bounding Box Area: 557668)
Object detected at: Top (Bounding Box Area: 50787)
Object detected at: Top Right (Bounding Box Area: 125760)

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**Figure 7.** Extracting figure Size and proportion from the child drawing

A significant innovation in this process is the integration of Large Language Models (LLMs) to generate descriptive text based on extracted visual features and contextual prompts from the drawings. Models like CLIP or GPT-3 can transform visual data into coherent, human-readable descriptions. After the neural network (NN) extracts key features from the drawings—such as object shapes, proportions, and spatial arrangements—the LLM generates an interpretation within a psychological framework. For instance, the model might produce a sentence like: "The drawing shows a solitary figure with exaggerated proportions, potentially reflecting feelings of isolation or anxiety".

Moreover, the system can respond to additional prompts or questions to further refine and expand the analysis. In particular, in this work, in addition to the characteristics, 10 questions were also used.

For the generation purpose LLAMA:7b was used for assessing the answer to the question for the drawings discussed before. Particularly for the drawing below answer are enlisted in the table below:

**Table 1.** Extracting the answers from the drawing

Question	Answer
Describe the child drawing, focusing on any visual cues that indicate the child's emotional state.	The child has drawn a small, simple house in the top right corner and a large tree in the center of the image with its branches reaching out towards the bottom right corner. There's a cartoon figure standing in front of the house, seemingly watching it. A bird is flying over the scene. The child has also drawn a small bird flying over the scene, which might symbolize hope, freedom, or an escape from the danger. The tree represents a longing for love and security.
Based on the drawing, what are the emotional states that can be inferred about the child's overall mood?	The child's drawing suggests a sense of safety and contentment. The presence of a house and a tree indicates a sense of security and stability. The bird flying over the scene suggests a sense of freedom and hope. The overall mood seems to be calm and content.
How does the child portray relationships between characters or objects in the drawing? Is there any specific detail that shows social or emotional connections?	In the child's drawing, there is a scene with a house in the background and trees around it. A bird appears to be flying towards or away from the house. There is a figure near the bottom of the picture, looks like a child. The drawing seems to highlight the importance of family, nature, and personal freedom. There is a bird drawn. Illustration of a child sleeping, usually with a teddy bear. It could also be seen as an expression of the child's imagination and creativity in depicting these connections.
Describe the interaction between the figures in the drawing and what they might indicate about the child's perception of social dynamics.	The drawing depicts a scene with a house and a tree in the foreground. The child appears to be looking at a bird or another form of shelter. The child seems to be enjoying the sunny weather, as indicated by the smile on their face and the presence of a sun in the drawing. This could indicate an interest in social dynamics as they may understand that houses are part of human society and the house represents a family or a home. The child's smile also suggests their connection to the aspect of nature.
What symbols or objects in the drawing reflect the child's emotional state, such as anxiety, fear, or happiness?	The presence of a sun in the background with birds flying around it no visible signs of distress. One could say that the child might be experiencing happiness or positive emotions at this moment. The tree and sun often symbolize growth, the past, and positivity, which aligns with the overall positive mood of the drawing.
Describe the symbolic meaning of recurring objects or themes in the drawing and how they might relate to the child's psychological well-being.	The drawing depicts a scene that includes various symbols symbolizing different aspects of the child's psychological well-being. There is a residential area with a house, which is a symbol for residential well-being. The sun represents a sense of security, belonging, or familiarity. It suggests stability and consistency in the child's life, which are essential for emotional well-being. The tree represents a longing for love and security. The bird flying over the scene suggests a sense of freedom and hope, which could represent positive emotions like joy, happiness, or optimism. It could represent that the child experiences or seeks to experience these positive emotions in their daily life.
How does the use of color and line intensity reflect the emotional state of the child?	The use of color in the drawing may represent the child's emotional state. For example, the use of bright colors like red, yellow, and orange could indicate a positive emotional state, such as joy or happiness. The interpretation of emotions from art can be highly subjective and varies greatly from person to person. It's also important to consider the context of the art or the context in which the drawing was created, as these elements can greatly influence the emotions that the viewer perceives.
Describe how the form, structure, and color choices in the drawing suggest underlying emotions such as joy, anxiety, or frustration.	The drawing depicts a scene with a child standing in front of a house, with a tree and some birds in the background. There are some cognitive or behavioral patterns that may be observed: 1. Joy: The presence of a bright sun and a clear sky might indicate feelings of joy or happiness due to pleasant weather conditions. The vibrant colors used for the scene could also represent a sense of cheerfulness. 2. Anxiety: The presence of a large tree in the background might suggest feelings of anxiety or fear, as trees are often associated with negative emotions. The interpretation of emotions from art can be highly subjective and varies greatly from person to person. It's also important to consider the context of the art or the context in which the drawing was created, as these elements can greatly influence the emotions that the viewer perceives.
What cognitive or behavioral patterns can be observed in the drawing, and how might these reflect the child's mental state or developmental level?	The drawing depicts a scene with a child standing in front of a house, with a tree and some birds in the background. There are some cognitive or behavioral patterns that may be observed: 1. Symbolic Representation: The child has likely used simple symbols to represent the elements in the scene. For example, the house represents a home, the tree could symbolize nature or growth, and the birds may represent freedom or movement. Symbolic representation is a common cognitive development in children. 2. Color Use: The use of colors can indicate several things. It might suggest an understanding of basic color concepts or it could be an attempt to depict the scene using the use of vibrant colors. 3. Line and Shape: The presence of simple line drawings, such as a house, a tree, and birds, and possibly a sun or moon suggests that the child may have been trying to include more details in their drawing to make it more comprehensive and engaging. This could indicate a growing interest in the use of lines and shapes to represent objects. 4. Detail and Complexity: The presence of multiple elements such as a tree, a house, birds, and possibly a sun or moon suggests that the child may have been trying to include more details in their drawing to make it more comprehensive and engaging. This could indicate a growing interest in the use of lines and shapes to represent objects. 5. Emotional Expression: The drawing of a person standing confidently in front of a house could suggest self-awareness, autonomy, or pride. Emotional expression can be an important part of a child's cognitive development, as they learn to express their emotions through various forms of communication. 6. Creativity and Imagination: The act of creating a scene with multiple elements demonstrates creativity and imagination. The child may have been imagining what it would be like to live in a house or interact with the birds.
Describe any elements of organization or chaos in the drawing and what they might indicate about the child's thinking process or emotional regulation.	In the drawing, we see a child's artwork depicting several elements: 1. Symbolic Representation: The child has likely used simple symbols to represent the elements in the scene. For example, the house represents a home, the tree could symbolize nature or growth, and the birds may represent freedom or movement. Symbolic representation is a common cognitive development in children. 2. Color Use: The use of colors can indicate several things. It might suggest an understanding of basic color concepts or it could be an attempt to depict the scene using the use of vibrant colors. 3. Line and Shape: The presence of simple line drawings, such as a house, a tree, and birds, and possibly a sun or moon suggests that the child may have been trying to include more details in their drawing to make it more comprehensive and engaging. This could indicate a growing interest in the use of lines and shapes to represent objects. 4. Detail and Complexity: The presence of multiple elements such as a tree, a house, birds, and possibly a sun or moon suggests that the child may have been trying to include more details in their drawing to make it more comprehensive and engaging. This could indicate a growing interest in the use of lines and shapes to represent objects. 5. Emotional Expression: The drawing of a person standing confidently in front of a house could suggest self-awareness, autonomy, or pride. Emotional expression can be an important part of a child's cognitive development, as they learn to express their emotions through various forms of communication. 6. Creativity and Imagination: The act of creating a scene with multiple elements demonstrates creativity and imagination. The child may have been imagining what it would be like to live in a house or interact with the birds.

These generated descriptions can be compiled into structured psychological reports, offering clinicians a detailed, objective assessment of the child's emotional state, supporting more accurate diagnosis and treatment planning.

Once the features are extracted, a supervised learning model can be trained to classify the drawings based on emotional or cognitive categories (e.g., distress, calmness, or developmental delays). In our scenarios where labeled data is unavailable, unsupervised learning methods like clustering can be used to group children's drawings based on visual and text similarities. This allows for the identification of patterns or psychological themes without the need for predefined labels. Psychologists can examine the clusters to detect common psychological themes, such as isolation, fear, or aggression, that emerge across the dataset. Based on the features and text presented in this paper drawings of the child's were clustered using and are presented in the picture below.

This demonstration illustrates the power of combining deep learning, machine learning algorithms, and LLMs to analyze children's drawings in a clinical context. These techniques enable automated, scalable, and objective psychological assessments, reducing the workload for clinicians while improving the accuracy and consistency of diagnoses. By applying these methods, psychological assessments can be conducted more efficiently, providing deeper insights into children's emotional and cognitive states, and allowing for more timely and effective interventions.

**Conclusion:** As demonstrated throughout this paper, the application of machine learning techniques—specifically feature extraction, classification, clustering, and the use of large language models (LLMs)—offers a transformative approach to the psychological assessment of children's drawings. By utilizing Neural Networks (NNs) for feature extraction, these models can automatically detect important visual elements such as line intensity, figure proportions, color usage, and symbolic objects. This automated extraction reduces the subjectivity and variability associated with

traditional manual interpretation, improving the accuracy and scalability of assessments. In addition, classification and clustering algorithms provide structured ways to group children's drawings based on similar psychological themes, allowing for more objective analysis. For instance, clustering can reveal underlying emotional or cognitive states, such as anxiety, isolation, or aggression, even when predefined labels are unavailable. The integration of LLMs further enhances the interpretability of these assessments. By transforming extracted visual features into coherent and contextually relevant descriptions, LLMs can assist psychologists in generating structured reports that offer deeper insights into the child's emotional and cognitive states. These generated descriptions reduce the burden on clinicians while maintaining the richness of psychological interpretation. By automating many aspects of psychological assessment, these technologies provide clinicians with more consistent, reliable, and faster results. As these machine learning methods continue to evolve, their broader adoption in clinical and educational settings could lead to more comprehensive and efficient psychological evaluations, providing timely insights into children's emotional and cognitive development. In particular, the objective analysis of children's drawings using these advanced technologies has the potential to enhance understanding and intervention strategies for various psychological and emotional challenges, ultimately improving outcomes for children in need of psychological support.

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## **ОСОБЕННОСТИ ПРИМЕНЕНИЯ ИНСТРУМЕНТОВ МАШИННОГО ОБУЧЕНИЯ ДЛЯ ПСИХОЛОГИЧЕСКОЙ ОЦЕНКИ ДЕТСКИХ РИСУНКОВ**

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В статье представлен анализ особенностей применения проективных методов для тестирования психологического состояния детей, а также пилотажный эксперимент по внедрению инструментов машинного обучения для психологической оценки рисунков. Эти вопросы необходимо рассматривать комплексно, поскольку большинство методов психологической оценки и, в частности, проективных технологий предъявляют особые требования к надежности и валидности, а также требуют специальной подготовки и профессиональной компетентности для их интерпретации. Целью исследовательского проекта является использование оцифрованных рисунков, созданных внутренне перемещенными детьми Нагорного Карабаха, в качестве инструмента для выявления и оценки их психологического состояния с использованием методов машинного обучения. Мы считаем, что этот подход может дать ценную информацию о психическом благополучии детей, пострадавших от конфликта, и может служить диагностическим инструментом в периоды экономического и гуманитарного кризиса. Предлагаемый подход извлечения признаков в психологической оценке определяет ключевые визуальные элементы, такие как размер объекта, цвет и пространственные отношения, которые дают представление об эмоциональных и когнитивных состояниях. Таким образом, применение методов машинного обучения, и, в частности, извлечения признаков, классификации, кластеризации и использования больших языковых моделей (Large Language Models), предлагает преобразующий подход к психологической оценке детских рисунков. Используя нейронные сети (Neural Networks) для извлечения признаков, эти модели могут

автоматически обнаруживать важные визуальные элементы, такие как интенсивность линий, пропорции форм, использование цвета и символические объекты. Это автоматизированное извлечение снижает субъективность и изменчивость, связанные с традиционной ручной интерпретацией, повышая точность и масштабируемость оценок. Кроме того, алгоритмы классификации и кластеризации предоставляют структурированные способы группировки детских рисунков на основе схожих психологических тем, что позволяет проводить более объективный анализ.

**Ключевые слова:** проективный метод, детские рисунки, инструменты машинного обучения, большие языковые модели, нейронные сети, психологическая оценка.

## ՄԱՆԿԱԿԱՆ ՆԿԱՐՆԵՐԻ ՀՈԳԵԲԱՆԱԿԱՆ ԳՆԱՀԱՏՄԱՆ ՄԵՔԵՆԱՅԱԿԱՆ ՈՒՍՈՒՑՄԱՆ ԳՈՐԾԻՔՆԵՐԻ ԿԻՌԱՐՄԱՆ ԱՌԱՋԱՆԱՀԱՏԿՈՒԹՅՈՒՆՆԵՐԸ

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Հոդվածում վերլուծված են Երեխաների հոգեբանական վիճակի ուսումնասիրման պրոյեկտիվ մեթոդների օգտագործման առանձնահատկությունները, ինչպես նաև ներկայացված է նկարների հոգեբանական գնահատման համար մեքենայական ուսուցման գործիքների ներդրման պիլոտաժային փորձ: Այս հարցերը պետք է համակողմանի դիտարկվեն, քանի որ հոգեբանական գնահատման մեթոդների մեծ մասը և, մասնավորապես, պրոյեկտիվ մեթոդիկաները ունեն հուսալիության և վալիդության հատուկ չափանիշներ, ինչպես նաև պահանջում են հատուկ պատրաստվածություն և մասնագիտական իրավասություն դրանց մեկնաբանման համար: Հետազոտական նախագիծի նպատակն է օգտագործել թվայնացված նկարները, որոնք ստեղծվել են Լեռնային Ղարաբաղյաց տեղահանված Երեխաների կողմից՝ որպես գործիք՝ բացահայտելու և գնահատելու նրանց հոգեբանական վիճակը՝ օգտագործելով մեքենայական ուսուցման մեթոդները: Մենք կարծում ենք, որ այս մուտքումը կարող է արժեքավոր տեղեկատվություն տրամադրել կոնֆլիկտներից տուժած Երեխաների հոգեբանական բարեկեցության մասին և կարող է ծառայել որպես ախտորոշիչ գործիք տնտեսական և հումանիտար ճգնաժամի

ժամանակ: Հոգեբանական գնահատման ժամանակ հատկանիշի բացահայտման մոտեցումը սահմանում է հիմնական տեսողական տարրերը, ինչպիսիք են օբյեկտի չափը, գույնը և տարածական հարաբերությունները, որոնք պատկերացում են տալիս հոգական և ճանաչողական վիճակների մասին: Այսպիսով, մեքենայական ուսուցման մեթոդների կիրառումը և, մասնավորապես, առանձնահատկությունների դուրսքերումը, դասակարգումը, կլաստերավորումը և Լեզուների մեջ մոդելների օգտագործումը առաջարկում է փոխակերպիչ մոտեցում երեխաների նկարների հոգեբանական գնահատմանը: Օգտագործելով Նեյրոնային ցանցերը՝ առանձնահատկությունների դուրսքերման համար, այս մոդելները կարող են ավտոմատ կերպով հայտնաբերել կարևոր տեսողական տարրեր, ինչպիսիք են զծի ինտենսիվությունը, ծևի համամասնությունները, գույնների օգտագործումը և խորհրդանշական առարկաները: Այս ավտոմատացված արոցեսը նվազեցնում է ավանդական ծեռուկ մեկնաբանության հետ կապված սուբյեկտիվությունը և փոփոխականությունը՝ բարձրացնելով գնահատումների ճշգրտությունն ու մասշտաբայնությունը: Բացի այդ, դասակարգման և կլաստերավորման ալգորիթմները տրամադրում են երեխաների նկարները խմբավորելու կառուցվածքային եղանակներ՝ հիմնված նմանատիպ հոգեբանական թեմաների վրա, ինչը թույլ է տալիս ավելի օբյեկտիվ վերլուծություն իրականացնել:

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**ԲՈՎԱՆԴՌԿՈՒԹՅՈՒՆ \* СОДЕРЖАНИЕ \* CONTENTS**

Anahit Gevorgyan THE ROLE OF PSYCHOLOGICAL SAFETY IN THE PERCEPTION OF ORGANIZATIONAL CRISIS BY EMPLOYEES (ON THE EXAMPLE OF RA LABOR MARKET).....	3
Anastasiia Shumarova ADAPTIVE MECHANISMS UNDER CONDITIONS OF CONSTANT EXPOSURE TO EXTREME STRESS IN THE CIVILIAN POPULATION...12	
Arman Babayan, Yenok Hakobyan, Hrant Avanesyan, Hrachya Hovhannisyan FEATURES OF APPLICATION OF MACHINE LEARNING TOOLS FOR PSYCHOLOGICAL ASSESSMENT OF CHILDREN'S DRAWINGS .....	22
Armen Grigoryan, Sahak Hovhannisyan INVESTIGATION OF ASSESSMENT OF THE ATTITUDE OF STUDENTS TO A HEALTHY LIFESTYLE .....	38
David Hayrapetyan, Narine Mirzoyan DEVELOPING THE THEORETICAL RESOURCE MODEL FOR REFUGEE STUDENT INTEGRATION .....	44
Karine Hakobyan, Lusine Stepanyan EXPERT ASSESSMENT OF THE PROFESSIONAL COMPETENCIES OF THE RESCUERS .....	61
Marine Mikaelian PSYCHOLOGICAL SUPPORT FOR FAMILIES AFFECTED BY WAR (BY THE EXAMPLE OF THE 2020 ARTSAKH WAR) .....	71
Vitya Yaramishyan, Armenuhi Santrosyan SOCIAL-PSYCHOLOGICAL PREREQUISITES OF THE FORMATION OF ETHNIC IDENTITY AND MENTALITY OF THE INDIGENOUS ARMENIAN POPULATION OF ARTSAKH .....	84
<b>Հոդվածներին ներկայացվող պահանջները.....</b>	<b>101</b>