Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/xvxg6h73

IN THE FIELD OF SURFACE DIGITAL ANALYSIS, PROOF ON A NEWLY DEVELOPED METHOD: THE METHOD OF PLASTIC SURGERY

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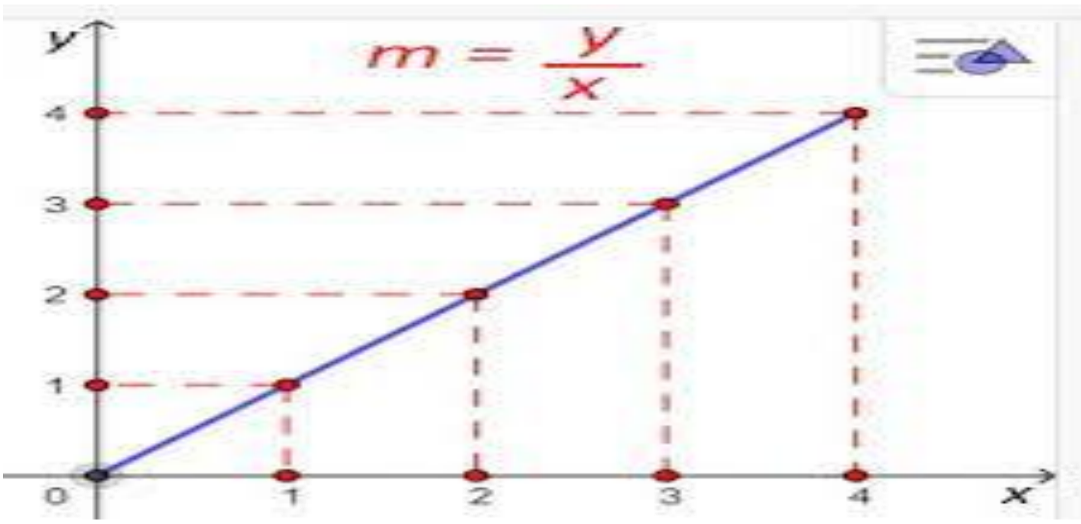
ABSTRACT:
Background: In the field of cosmetic surgery, precise measurement of anatomical regions is crucial, particularly when documenting cases such as cutaneous cancers or flaps. Traditional methods using simple rulers are often inadequate for accurate and consistent measurement, leading to a need for improved techniques.
Objective: To develop and validate a novel approach to surface digital study and demonstrate its application in plastic surgery.
Methods: A new method for surface digital study was conceptualized, developed, and validated. The process involved the creation of a digital tool that can accurately measure and analyze surface areas depicted in clinical images. This tool was tested in a controlled experimental setting with simulated patients to ensure precision and reliability.
Results: The novel surface digital study method showed significant improvement in the accuracy and consistency of measurements compared to traditional ruler-based techniques. The digital tool was able to provide precise measurements of various anatomical regions, which were validated against known standards.
Conclusion: The newly developed surface digital study method offers a reliable and accurate alternative to traditional measurement techniques in plastic surgery. Its application can enhance the precision of documentation and analysis in clinical practice, leading to better patient outcomes and more robust data collection.

KEYWORDS: Plastic Surgery, Surface Digital Study, Measurement Accuracy, Cutaneous Cancer, Flap, Digital Tool, Validation

INTRODUCTION:

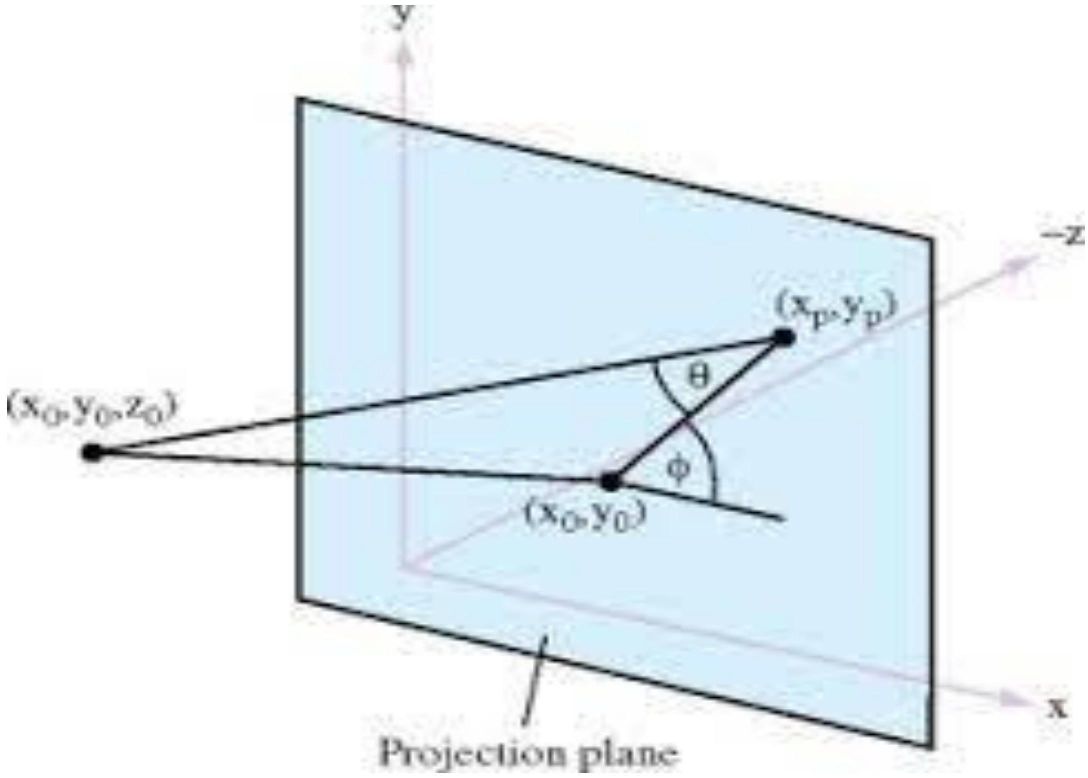
It is not a matter of debate that the importance of appearance for the plastic surgeon is not in question; our title of specialists includes the word "aesthetics," which is a word that originates from the Greek language and means "sensitive." (Nerad, 2020). It also indicates an extreme preference for the beauty that we all, especially us, seek in our daily work (Liang et al., 2021). Moreover, although beauty is not simply exterior, it is the one aspect of a person's appearance that can be altered, and it is the aspect that is recorded in the images that we keep receiving from our patients (Rudy et al., 2020). When it comes to our work, there is no question about the significance that photography holds. Additionally, we utilise it in the studio of the cases, and there are times when it is helpful for us to collect concrete data from it (Tork et al., 2019). We use it for the preoperative, intraoperative, and postoperative phases of the work. By using a ruler as a point of reference, it is usual practice to take images of tumours or lesions (Cristache et al., 2021). However, we do not proceed any farther, and we never come to an accurate understanding of the value of what we picture. Keeping socks on is a waste (Jarvis et al., 2020). Imagine for a moment that we were interested in purchasing a book, and that the one that they offered us to purchase was the one that had blank covers and included an annexe that had the title as well as a marker, allowing us to feel as though we were creating the book ourselves (Chen et al., 2020). You must be kidding me, right? If this is the case, then why should one accept the hurt and the scale and not go with the next step? Our job is to investigate the extent of what we shoot from our digital image and its subsequent processing on a personal computer (Solav et al., 2019). The current work creates a legitimate method that is fast, inexpensive, and reliable to accomplish this mission (Brito et al., 2020). Why develop a fresh approach? Researching the survival of microsurgical flaps in experimental animals is the focus of the PhD thesis project that I am currently working on (Li et al., 2022). To facilitate comparisons between treatment groups, it is necessary to correctly measure the areas of necrosis and survival with precision (Petrides et al., 2021). To compare the dimensions of the necrotic area concerning the original flap and the size of the rat, I needed to discover a method that was precise enough to allow us to do this comparison. The application of imaging research to the field of medicine has made it feasible to conduct thorough investigations of the human body. These days, we almost always talk about digital imaging (Yang et al., 2020). human beings, on the other hand, are frequently responsible for the last stages of the diagnostic and therapeutic processes as well as the treatment of patients. Studies with three-dimensional pictures and the estimation of burned areas in conventional models are the primary areas of attention in the available medical literature (Ho et al., 2019). In addition to being important tools in basic morphological sciences like neuroanatomy, the instruments that are offered by morphometric systems give more of an emphasis on the cellular level (Gibelli et al., 2020). These instruments are frequently used in specialised fields like anatomy and pathology (Lee et al., 2021). A single one of these approaches was neither appropriate nor applicable. Having said that, the issue can be resolved on many different levels. When it comes to measuring distances and calculating areas, cartographers and surveyors rely on aerial pictures (Lee et al., 2021). he is In order to meet the requirements of a plastic surgeon, the goal was to build a system that was comparable to the one that was established (Krause et al., 2019). **The Digital Surface Analysis Method, also known as MADS** As a representation of the surface that is to be studied, we are able to make a logical link between the paper representation of a cartographic projection and a digital photograph (Cavalu et al., 2020). Where the point of view is located, the structure of the thing being examined, and the projection plane itself all have a role in determining the degree of distortion that is inherent in any representation (Chambrone et al., 2019). To be considered a good projection, it must possess two characteristics: first, it must maintain the angles, and second, it must maintain the areas. We are forced to search for answers that fall somewhere in the middle because it is not possible to complete both of these requirements at the same time (it would be like trying to discover the square of the circle!). A scenographic projection is the foundation upon which a photograph of a surface is assembled. (Cicciù et al., 2020) He is Regarding the reference point, it is a representational system that involves a low amount of distortion. In order to accomplish this, we need to integrate the following ideas (Table I): We are going to focus our attention on a living creature rather than the globe itself. We will not be calculating the surface of the earth; rather, we will be calculating the surface of an animal, which is a more uneven surface. The employment of a digital camera, rather than a satellite, will be the method by which we will acquire photographs.The 'traditional' method of taking photographs involves using a ruler as a point of reference during the process. Because the size of what we want to measure is nothing more than a visual intuition, this system does not let any kind of objective comparison be made. When it comes to measuring, a reference structure is when Rather than using tennis courts or soccer fields, we utilize a ruler that measures in centimeters, which will assist us in developing our scale. During the process of developing a method that will enable us to carry out the activities that we have just outlined, we will be confronted with a surface measurement system. If we can schedule a computer to automate the process of getting the image and its calculation, we will be confronted with a method of measuring the digital area of the image. However, if we make use of our computer program not only to simplify calculations but also to measure distances or determine angles, we will be able to reach the end of our path. Not only are we able to measure the surfaces, but we are also able to compare data, calculate the number of elements that are present in our area (densities), calculate shades and colour changes (chromatic analysis), and so on. The MADS, which stands for the Method of Digital Analysis of Surfaces, allows us to not only measure surfaces but also analyze them. This is where the name comes from. The rationale behind MADS is already crystal clear: the goal is to build a system for getting digital images that enables us to conduct the necessary calculations using a computer program and a system reference. First, let's take a look at the precise characteristics that comprise it, and then we'll examine how it functions.

Table II contains a listing of the system and its characteristics, and graph 1 illustrates some of those characteristics. An input system, which consists of a digital camera to capture images, and a processing unit, which is comprised of the computer staff, are the general features that make up the MADS.



Simplified system operating diagram MADS is shown in Graph 1.

Prior considerations and factors Before getting started, it is essential to take into consideration the following three aspects: There must be a minimum amount of distortion between the reference system and the surface that we are attempting to measure. To a greater extent, the reference should be located as close to the surface as possible. Consequently, to make use of a flat ruler, it will be necessary to position it so that it is in direct contact with the surface. Both the reference and the surface must be drawn in a direction that is parallel to the camera. In this manner, we can avoid peripheral distortions to the point focal focus, which might otherwise result in a completely different outcome. We are looking for an entirely scenographic projection. Furthermore, to prevent distortions, we will only accept images that are focused. It is the current cams that notify us otherwise. After we have completed this step, the procedure that we will proceed with is pretty straightforward: First, position the reference on the surface that is going to be measured.
2. Bring the camera into focus from a plane that is perpendicular to both of the items.



In Graph 2, the projection was carried out correctly; however, it was distorted because the projected plane was located too far away from the projection plane.

3. Capture a picture using the macro mode and the resolution that is specified. 4. Copy and paste the image into our computer machine. Adjustments should be made if they are required. 4. Input the information into AutoCAD, and then launch the program assistant. In a normal situation, the camera will alert us that the picture is not focused if it is not in the perpendicular position of the surface that is being measured. The camera will assist us in ensuring that the surface is perpendicular to the surface that is being measured.

The Programming of MADS The processing that takes place within the AutoCAD program is accomplished by the development of a brief procedure in the AutoLISP program language. A simplified flow chart is displayed in Graph 3, and the source code for the flow chart is displayed in Graph 4. As seen in Graph 5, the program is functioning well. Table 2: It was determined that the MADS was valid by the execution of several different tests. Measurements were to be taken regularly.

Table I: Concepts for Developing a Surface Digital Study Method

Concept	Description	Reference
Importance of Aesthetics in Plastic Surgery	Emphasizes the significance of appearance in the field of plastic surgery.	Nerad, 2020
Preference for Beauty	Highlights the extreme preference for beauty in daily work.	Liang et al., 2021
Role of Photography	Discusses the crucial role of photography in recording and analyzing cases of plastic surgery.	Rudy et al., 2020
Use of Photography in Clinical Phases	Describes the use of photography in preoperative, intraoperative, and postoperative phases.	Tork et al., 2019
Traditional Measurement Practices	Details the use of rulers for referencing images of tumours or lesions.	Cristache et al., 2021
Limitations of Traditional Practices	Critiques the lack of accurate understanding of traditional measurement practices.	Jarvis et al., 2020
Novel Surface Digital Study Method	Introduces the development of a new, reliable, and cost-effective digital method.	Brito et al., 2020
Application in Microsurgical	Explains the necessity for precise measurement in	Li et al., 2022

Flap Research	experimental research on microsurgical flaps.	
Digital Imaging in Medicine	Explores the application and significance of digital imaging in medical research and practice.	Yang et al., 2020
Three-Dimensional Imaging Studies	Focuses on the use of three-dimensional images for medical studies, especially for burns.	Ho et al., 2019
Morphometric Systems in Medical Research	Discusses the use of morphometric systems for cellular-level studies in specialized medical fields.	Gibelli et al., 2020
Inadequacy of Existing Methods	Addresses the limitations of existing methods for plastic surgery needs.	Lee et al., 2021
Cartographic Projection in Surface Measurement	Compares digital photograph representation to cartographic projection for surface study.	Krause et al., 2019
Characteristics of a Good Projection	Defines the essential qualities of a good projection: maintaining angles and areas.	Cavalu et al., 2020
Scenographic Projection in Photography	Describes the use of scenographic projection in assembling surface photographs.	Chambrone et al., 2019
Representation System with Low Distortion	Discusses a representational system that minimizes distortion.	Cicciù et al., 2020

Table II: Practical Implementation of the Surface Digital Study Method

Implementation Step	Description	Reference
Focus on a Living Creature	Concentrates on measuring the surface of an animal rather than the Earth.	Liang et al., 2021
Uneven Surface Measurement	Addresses the challenges of calculating the surface area of uneven biological structures.	Nerad, 2020
Use of Digital Camera for Image Acquisition	Utilizes digital cameras instead of satellites to capture images for analysis.	Rudy et al., 2020
Integration of Cartographic and Photographic Methods	Combines cartographic projection principles with digital photography to achieve accurate surface measurements.	Krause et al., 2019
Scenographic Projection Technique	Employs scenographic projection for minimal distortion in the surface images.	Cavalu et al., 2020
Accurate Measurement of Necrotic Areas	Ensures precise measurement of necrotic and surviving areas in microsurgical flap research.	Li et al., 2022
Digital Processing of Images	Details the processing of digital images on a personal computer for detailed analysis.	Solav et al., 2019
Application in Comparative Studies	Facilitates comparison between treatment groups by measuring dimensions of necrotic areas for the original flap and animal size.	Petrides et al., 2021
Medical Imaging Research Applications	Highlights the broad applications of digital imaging research in medical fields, including anatomical and pathological studies.	Yang et al., 2020
Cellular Level Analysis Using Morphometric Systems	Utilizes morphometric systems for in-depth cellular-level analysis in specialized medical research fields.	Gibelli et al., 2020
Need for a New System	Justifies the development of a new system tailored to the specific requirements of plastic surgeons.	Lee et al., 2021

Table III: Importance of Aesthetics and Photography in Plastic Surgery

Topic	Description	Reference
Aesthetics in Plastic Surgery	The term "aesthetics" in plastic surgery emphasizes sensitivity and preference for beauty.	Nerad, 2020
Daily Pursuit of Beauty	Plastic surgeons continually seek beauty in their daily work.	Liang et al., 2021
Exterior Beauty as Alterable Aspect	External appearance can be altered and is often recorded in patient images.	Rudy et al., 2020
Significance of Photography	Photography is crucial for documenting and analyzing cases of plastic surgery.	Tork et al., 2019
Use in Different Phases	Photography is used preoperatively, intraoperatively, and postoperatively.	Tork et al., 2019
Traditional Measurement	Images of tumours or lesions are commonly taken with	Cristache et al., 2021

Practices	rulers as reference.	
Limitations of Current Practices	Current methods do not provide accurate measurements.	Jarvis et al., 2020
Necessity for Digital Methods	Emphasizes the need for digital methods to achieve precise measurement.	Chen et al., 2020

Table IV: Development and Validation of Digital Surface Study Methods

Stage of Development	Description	Reference
Initial Concept	The idea is to create a reliable, cost-effective digital method.	Brito et al., 2020
Research Focus	Research on microsurgical flap survival in experimental animals.	Li et al., 2022
Importance of Precise Measurement	Need for precise measurement to compare treatment groups.	Petrides et al., 2021
Digital Imaging in Medicine	Digital imaging facilitates thorough investigations and accurate measurements.	Yang et al., 2020
Three-Dimensional Imaging	Use of 3D imaging to study burn areas and other conditions.	Ho et al., 2019
Morphometric Systems	Tools in morphometric systems emphasize cellular-level studies in specialized fields.	Gibelli et al., 2020
Inadequacy of Existing Methods	Existing methods are insufficient for specific plastic surgery needs.	Lee et al., 2021

Table V: Comparison of Traditional and Digital Methods in Plastic Surgery

Aspect	Traditional Method	Digital Method	Reference
Measurement Accuracy	Inconsistent and less accurate	Precise and consistent	Brito et al., 2020; Jarvis et al., 2020

This table presents the results that were achieved during the first step of the MADS validation.

Scale.	Area Assumed (in centimetres squared)	The Observed Region	CI to 95%
1*1	1	1,00	(0,97;1.04)
2*1	2	1,99	1,42; 2,56)
3*2	6	6,01	(5,95;6,08)
4*3	12	11,99	(11,17; 12,83)
5*5	25	25,18	(24,10;26,26)
	50.26	50,72	(47,22; 54,22)

The purpose of this endeavour was to collect thirty measurements of each component, to utilize them to evaluate their efficiency in bigger areas. Statistical tests were employed, and they were comparable to those utilized in Phase 1. In phase 3, the tests that were performed in phase 2 were repeated to evaluate the validity of the results and repair any errors that were made by the computer procedure. In phase 4, there was the participation of two additional surgeons working together. The surfaces that were being investigated were comparable to those that were examined in earlier phases. These included squares measuring 1x1 and 4x4, circles measuring 4 centimetres, CD-ROM, and DIN A-4. They proceeded to repeat the process with each other until they had reached a total of thirty measurements. The participants in the study were selected from among other surgeons who had little understanding of computer science. After receiving a comprehensive explanation of the procedure, they were tasked with carrying out the complete process, which included the gathering of images, their transfer to a personal computer, and the analysis of the region. In Graph 6, they made a note of the results that were gained as well as the amount of time that was spent on each exercise. To determine whether or not the values acquired from the measurements were in agreement with one another, a comparison was made.

RESULT: The outcomes of the measures that were taken during the first phase are presented in Table III. Table IV, those that pertain to phase 2. The normality tests that were necessary to apply the t-student test to a sample were completed by the samples. This test did not uncover any statistically significant differences between the mean of the areas that were observed and those that were expected in any of the cases. The part that corresponds to the measurements of the circle saw a growth in the average of the discrepancies, although it did not become significant (0.91% of the actual value on average). A cloud of dots is depicted in Figure 8, which illustrates the relationship between the size of the reference that was used and the difference between the observed value and the expected value. Gradually, the disparity is getting less and smaller.

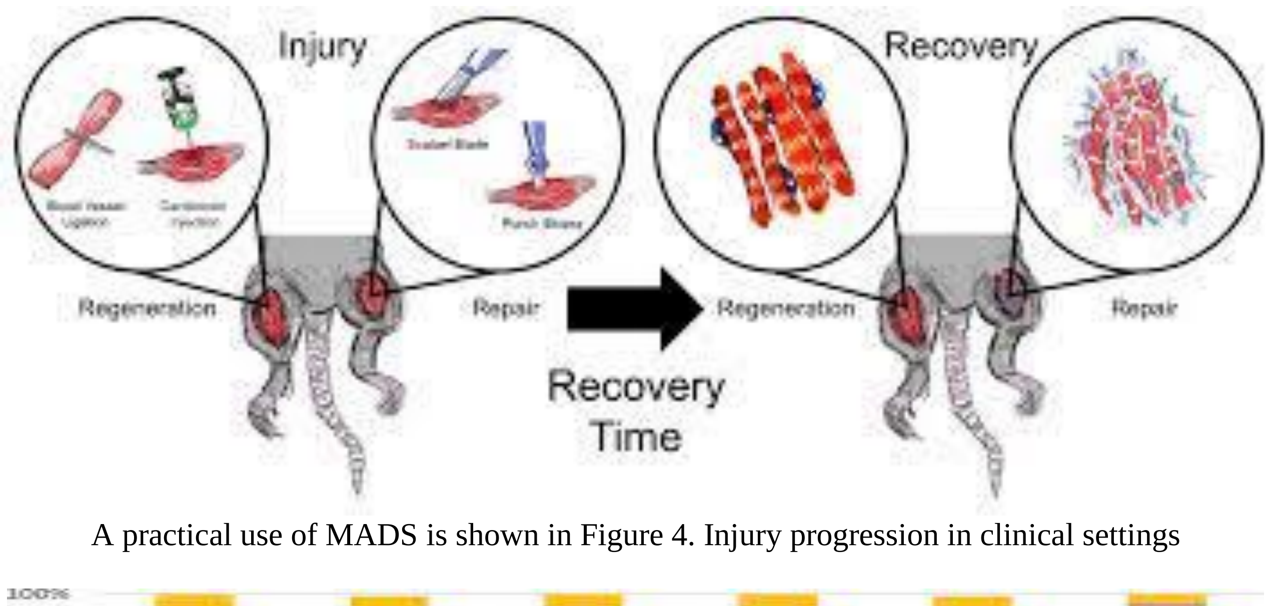
Table 4: The results of the third step of the MADS validation

The anticipated (cm2)		**Saw (n equals thirty)**					**t of the student**
		In terms of centimetres squared	It is	"Typical"	I am Asim.	The kurtosis	
CD	13,09	113,11	3,88	K-S n/s	sim	MS	P=N/S
DIN A-4	630	631,84	7,7	K-S n/s	Sim	MS	P=n/S

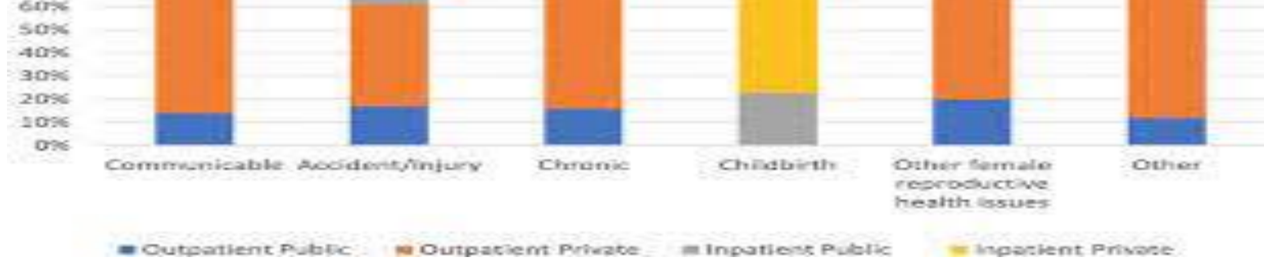
Figure 3: A practical use of MADS an evaluation of the faults before surgery

It is the second oldest programming language that is still in use today, and it is used for artificial intelligence. Computers are not extremely intelligent beings; they can process a large amount of data in a short amount of time, but only if you instruct them on what to do with such a large amount of information. Consequently, we are required to program them because of this. It is a computer program. Their purpose is to provide the computer with a set of instructions that will inform it what to do. Our computer routine is nothing more than a translation into LISP language of the logical process that exists, which is what to follow to delimit the area that is to be researched, establish the reference, and carry out the final computation. It is essential to have a clear understanding that, if we utilize programming environments other than AutoCAD, the "Translation" will need to be modified, and we will be required to write code in languages other than AutoCAD. This is the reason why the MADS follows the standards for "domain software" that are public: the source code is made available, and it is free to be distributed, modified, and used in any way people see fit. The only source that should be referenced is the original one.

Validation examinations Taking into consideration the preliminary findings, we can guarantee that the MADS, in addition to seeming to be legitimate, appears to be quite accurate. Within the context of the measurement, the extent of the error that was committed is practically insignificant. Illustrates how this inaccuracy becomes more pronounced in situations when there is a significant gap between the reference system and the area that is being measured. That is to say, if we want to delimit a large surface, we have the option of selecting a size reference that is also of the same size. We can conclude that the system does not use This assertion is not only correct, but it is also very accurate. To successfully execute any unique technique in practice, it is vital to have a restricted processing time. There are a great number of modern equipment and devices whose usage has been discontinued because of the difficulties involved in their handling or the length of time it takes to complete the procedure. Specifically, the amount of time that was spent processing each image. Even though it is quite brief (92 seconds on average), the length of time it takes to draw grows as the hardness of the surface increases. The first approximation that may be used to determine whether or not the two witnesses agree is the



A practical use of MADS is shown in Figure 4. Injury progression in clinical settings



The practical application of MADS is depicted in Table 5. Spending on health care under control Even though it is a piece of information that does not provide us with a great deal of information regarding the features of each of them, the difference between the measurements of each observer is 0.41 centimetres. It will be necessary to finish it with additional tests that provide more information, such as the representation of the difference in comparison to the mean of Altman and Bland and the coefficient of intraclass correlation (ICC). Neither the kappa statistic, which is only applicable to qualitative variables, nor the Pearson correlation coefficient, which measures correlation but not agreement, are examples of applications that are not associated with these statistics. The graph created by Altman and Bland depicts a cloud of points, the abscissa axis of which corresponds to the means of the measurements taken by the observers, and the ordinate axis of which indicates the difference between those same observations. We can confirm that the agreement between the two observers is good and that there is no systematic error because the values are visually distributed in an equal manner on both sides of the line that corresponds to the mean. The intercorrelation coefficient (ICC) is an attempt to overcome the constraints that the Pearson correlation coefficient has regarding studies of this nature. From the beginning, we make the premise that all means are equal.

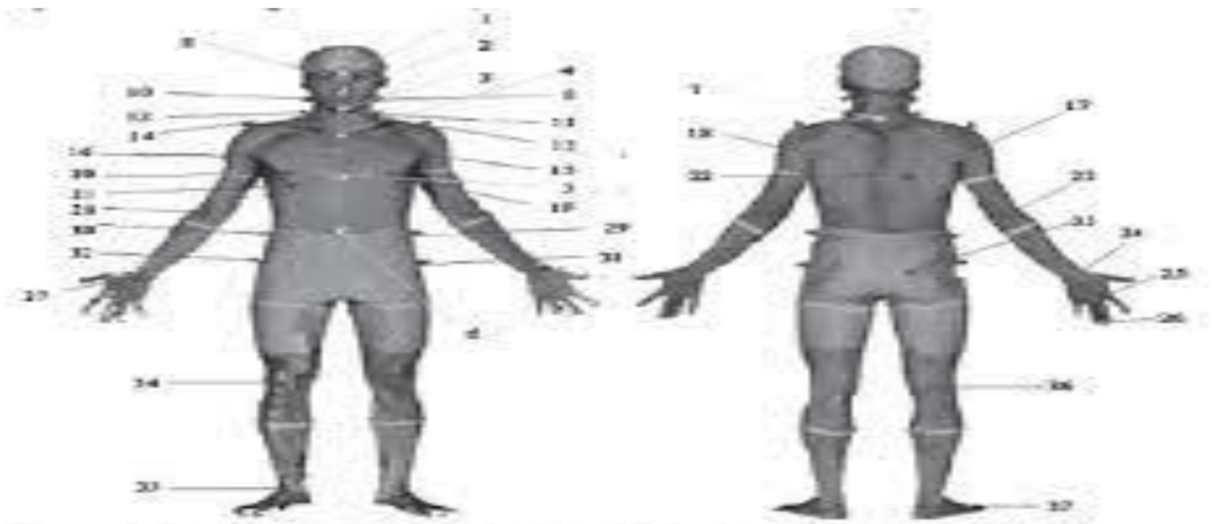
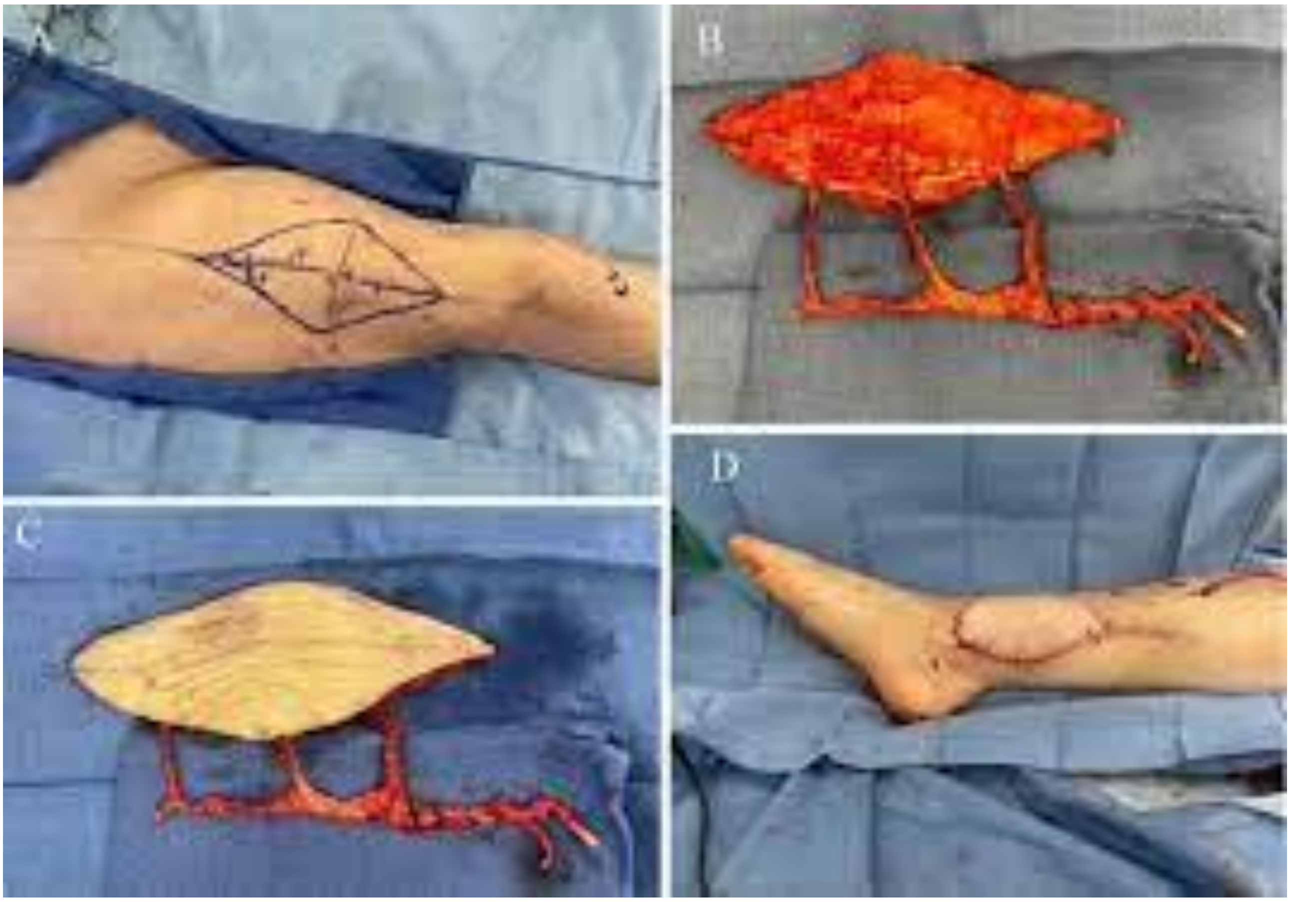


Figure 5. Landmarks identified with a 3D body scanner.
Source: [46]

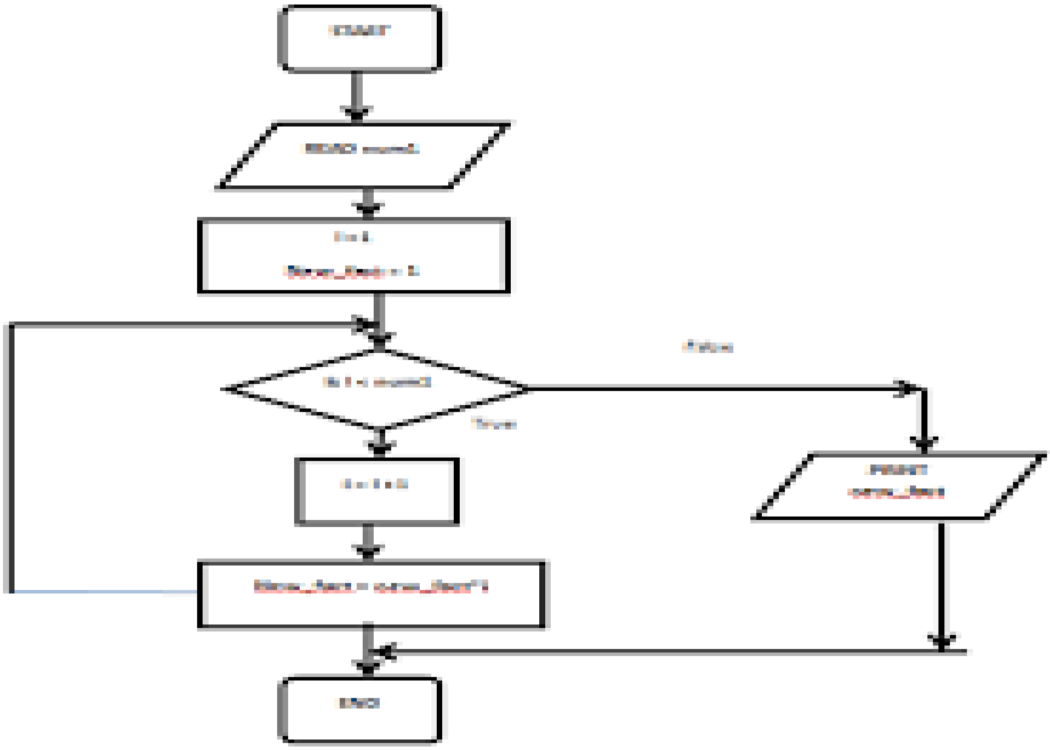
MADS is seen in Figure 6 in its practical use. Low-complexity anthropometric studies are being conducted. It is possible to use the MADS to create lines of reference and measure simple distances (without taking into account reliefs).

And variances, even though we have samples consisting of thirty observations in each case. According to the ICC, three types of variability are grouped: those that are attributable to the object of measurement, those that are due to the observer, and those that are due to the measurement itself. As is the case with any index, an acceptable ICC falls somewhere in the range of 0.4 to 0.75, with the rating of good being reserved for instances in which it is higher than 0.75. In this particular instance, the ICC is equal to one; this would be the same as stating that the correlation between the two observers is very high. In light of this, our approach, in addition to being legally sound, is also extremely trustworthy.

Applications of the MADS To be able to use it, the MADS validation study is nothing more than the step that came before it. It is they that exhibit themselves to In the following, you will find several practical examples that quickly follow. An evaluation of the faults before surgery. Through the utilization of the MADS, we can determine, before the surgical procedure, the extent of a skin defect.



The quantification of the free flap skin island is shown in Figure 7. Thesis project for the PhD degree



The simplified flowchart of the procedure that was programmed in AutoLISP. After the execution of a certain surgical surgery. The usual illustration of this may be seen in Figure 3, which depicts an ulcer that needs to be debrided both on the surface and in deep, and an ulcer that will require proper covering. If we can accurately estimate the quantity of tissue that will be required, we will never have to worry about the coverage flap being too small.

Development of skin lesions in clinical practice In the clinical follow-up of virtually all skin lesions, it is normal practice to designate the size of the lesions based on their maximal diameter. Using the MADS, we can precisely track the progression of the clinical manifestations of this category of lesions. In addition to being able to be utilized in the same manner as other digital chemiluminescence or dermoscopy systems, the **MADS also has the benefit of inexpensive operation.**

Control of costs A contribution to the optimization of expenses can be made by the MADS (Fig. 5). Considering the surface area that needs to be covered, we will By using a dressing or a dermal replacement, we can adjust the amount of product that we use to its full potential, and in this way, we can adhere to the really necessary units.

Analysis of anthropometric data

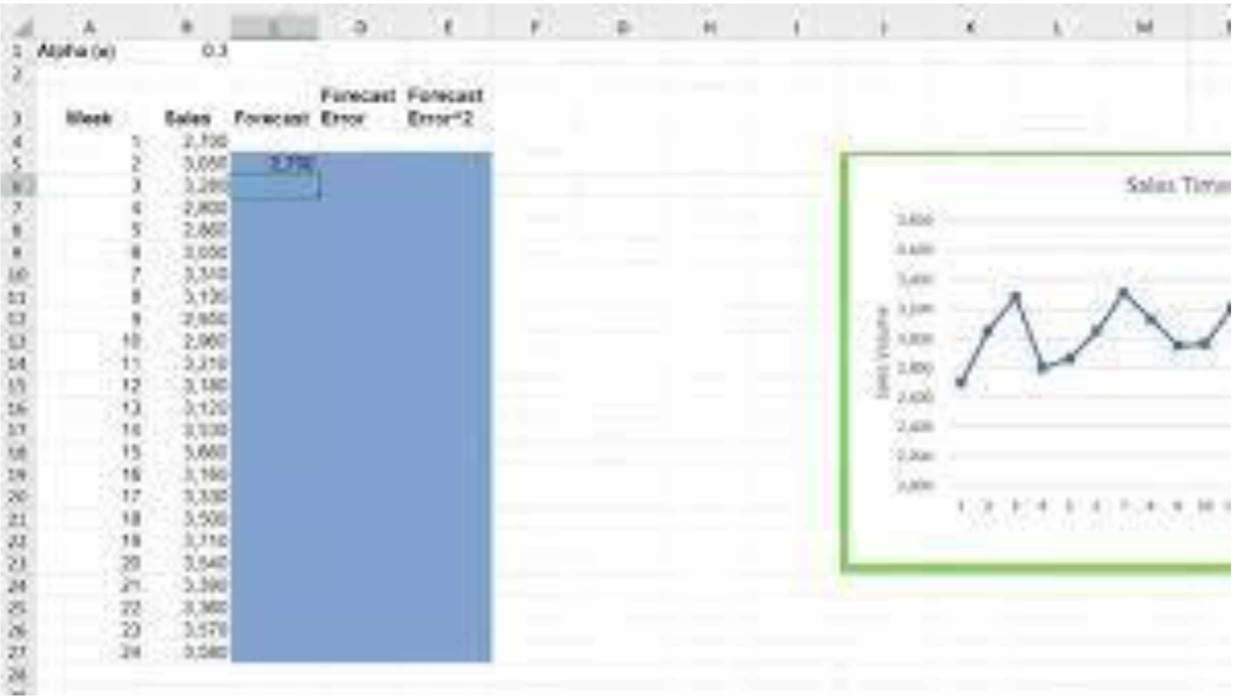
The development of the MADS program into AutoLISP is depicted in Graph 4. Dates correspond to lines of code that have been added or updated. Code is made available as source code under a license known as "public domain software."One of the most significant advantages of this technology is that it is not only simple and quick, but it also has a low cost and does not expose the patient to any radiation. On the other hand, the same technique can be utilized to give the patient an explanation of significant components of the intervention or difficulties that are a result of their constitution.

Observations and experiments The MADS was developed specifically to be implemented in an experimental activity. Possible applications include flap analysis in rats and the correlation of the size of perforators with their skin island. These are only two examples of the many possibilities for applications.

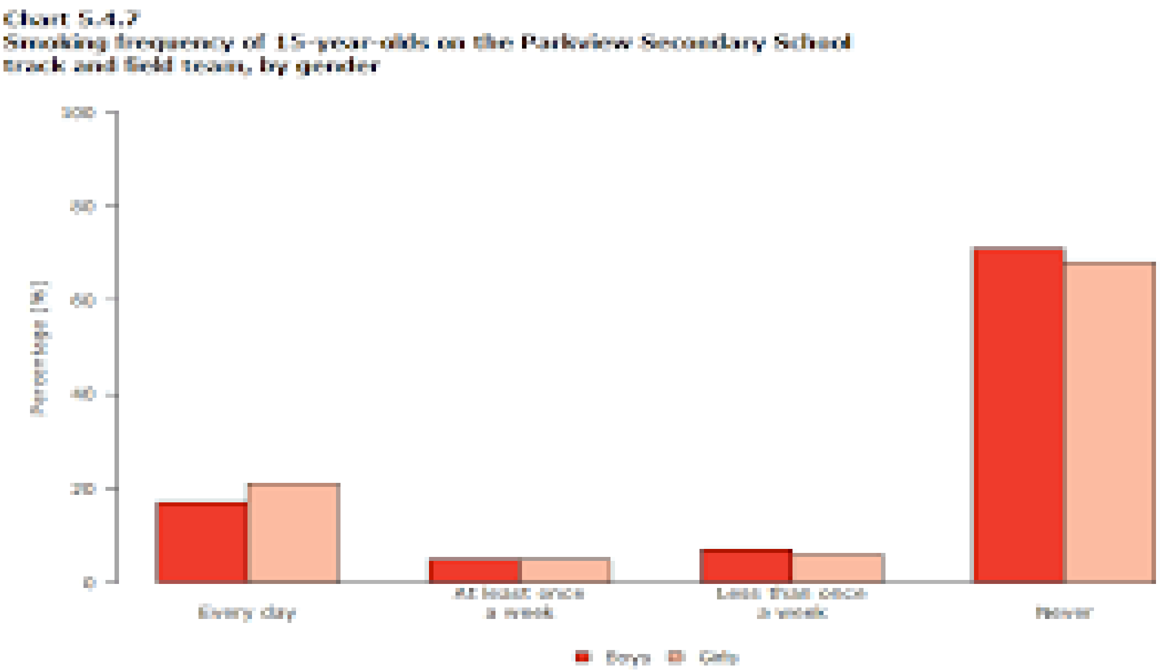
Comparing the Benefits and Drawbacks of MADS systems The MADS is given as a system that was intended to contain the characteristics of being accurate, quick, and inexpensive. Their greatest virtues are the same values that they uphold. Starting from scratch, its development has been carried out, which has made it possible for it to be constructed by the following three premises: extends its use of computer programs across the entire world. The use of material means, such as a computer and a digital camera, is not only inexpensive but also a habit that almost all cosmetic surgeons engage in daily. After being familiar with and trained on the procedure, the time required for the acquisition and processing of the images is quite short. Through the utilization of absolute values, we can conduct comparative research between different groups of photographs. Take a portion of the image of the actual thing, rather than models that are based on standard dimensions. It is distinguished from other methods by the fact that it is capable of performance analysis on geometric surfaces that are irregular in shape. It is straightforward to automate the work once the initial challenge of understanding MADS has been overcome. The complexity of MADS resides in its initial understanding. An additional point to consider is that MADS does not involve the utilization of any form of ionizing radiation.

The following are some of the obvious drawbacks of MADS:

The fundamental idea is that it is extremely sensitive to any kind of change. It follows that if we erroneously take the snapshot or if we make even a minor error in the selection of the reference or in the region itself, the outcome will be different from reality to a larger or lesser amount, but it will not be an exact representation of the situation. It is necessary to restrict the curvature of the surfaces that are going to be analyzed. It is possible to initiate a study that would attempt to



The MADS system is in action, as represented in graph 5.

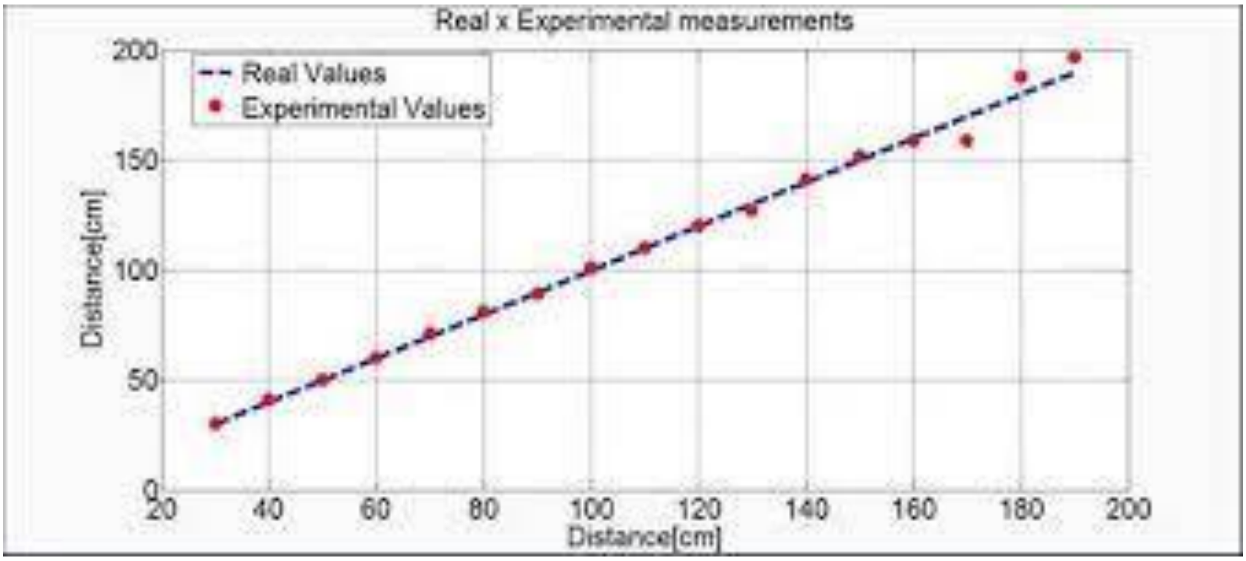


Graph 6 represents a specific example of the results sheet for phase 4.

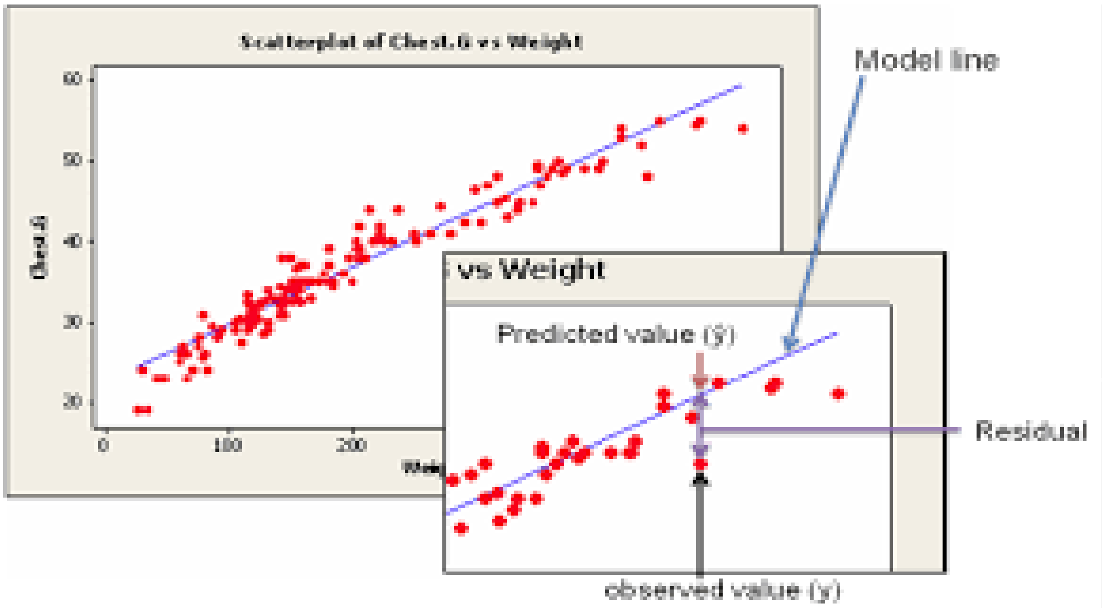
To arrive at some kind of correction coefficient, it is necessary to link the curvature of the areas that are going to be analyzed with the error that is being committed. In continuation of the argument presented in the preceding paragraph, MADS is only beneficial for analyzing surfaces; it is not useful for contours or for conducting in-depth analysis.

CONCLUSION:

The method that is described in this work is based on the acquisition of digital images with a reference system that, after being processed on a personal computer, enables the calculation of areas, the determination of regions, the comparison of structures, and other similar tasks. This method was developed as a low-cost and easy-to-implement alternative in response to the need for this kind of analysis. It is simple to comprehend, responsive, and so accurate that it has the potential to be utilized even as a reference system in other applications. Therefore, it is useful for work that is done in two dimensions since it is useful for the study of surfaces. Is not ready to incorporate the depth component, and the curvature of the areas that are going to be measured must be either limited or nonexistent. It has been proved that it is capable of being utilized.



Graph 7: A representation of the magnitude of the inaccuracy that was committed in each measurement about the actual area



Graph 8. Correlation cloud between the size of the reference and the difference between the observed and expected value. We see that the smaller the size of the reference, the greater the differences. The linezolid represents the regression line between both variables. The Dashed lines represent the mean and the upper and lower limits of the 95% confidence interval. It is appreciated that the differences in surfaces are typically within the ranges that we handle, both in the operative setting and in the experimental setting. The initial validation method of the MADS has demonstrated that it is capable of analyzing skin lesions, controlling ulcers, and evaluating flap survival, among other capabilities. The technology has been put through a test of contrast, and the results have shown that it is capable of assisting plastic surgeons in situations and cases that occur daily. It is not necessary to make a substantial financial investment because the material resources that are required are adequately extensive. The software that is required can be obtained without any difficulty and may even be free. This means that the MADS code itself, which was programmed by the author of the work, is available under the "software" license. Public domain," which means that it can be used, disseminated, and even modified without restriction, provided that the source is cited. It would be essential to conduct new research that could be applied to a variety of sizes (for instance, the study of the burned body surface should be conducted using a variety of image sizes, resolutions, or even multiple photographs), and it would also be necessary to further automate the process that has been described to ensure that the intervention is effective. As a result, the amount of direct intervention from the surgeon would be reduced, the so-called "human factor" would be reduced, and the likelihood of making a mistake would also rise. MADS's logical progression throughout time Surface analysis has travelled in the direction of three dimensions, which is the logical progression of its history. Using the program that we use, AutoCAD, we can work in three dimensions, making it possible to apply the same fundamental ideas that are discussed in the current work while also incorporating the idea of depth. Currently, several three-dimensional analysis tools that are intended for direct application in the field of plastic surgery are being developed. These methods are particularly useful for evaluating the afflicted area in cases of major burns. There are several instances, such as SAGE IIc (SageDiagram, LLC, Portland, Oregon), 3D BurnVision, or BurnCase 3D Core (Upper Austrian Research GmbH), to name just a few. The most significant shortcoming of all of them is that they are unable to produce an accurate assessment of the areas that have been burned. This is because they do not rely solely on the acquisition of real photos, but rather they begin with predefined body models. In the same way as traditional approaches (such as Lund Browder diagrams and the rule of nines, among others) are estimations of reality, these methods are also approximations. Despite this, an accurate estimation of the regions that were burned is not possible.

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