

Survey On Image Registration

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Abstract— Picture enrollment has crucial applications in therapeutic picture examination. The term picture enlistment fundamentally means the procedure of arrangement of pictures in which the last data is picked up from various information sources. It is a key preprocessing step where at least two pictures are adjusted into a typical arrange framework. Out of different sorts of enlistment techniques, a famous class is the one, which utilizes the entire picture substance to determine a reasonable change for overlaying the information pictures. Picture enlistment itself is made out of various stages like change, interjection, processing closeness metric and streamlining of the change parameters (interpretation, pivot, shearing and so forth). A central point that decides the achievement and adequacy of any enrollment technique is the methodology we utilize for accomplishing the ideal arrangement of change vectors. The search for change parameters for picture enlistment has been managed for the most part as a multidimensional improvement issue, which processes the geometric just as force changes at which the information pictures are having maximal closeness with each other. Escalate, the quick enhancement in the enclosure of military programmed target confession remote cartography, PC vision, picture combination, therapeutic imaging, and astrophotography has built up the requirement for the advancement of good picture enrollment procedure. A few writing approaches are fundamentally looked into, by exploring changes and hybridizations with Evolutionary Strategies. Since biomedical picture enlistment speaks to a difficult clinical undertaking, the exploratory discoveries energize further research contemplates sooner rather than later

Keywords—Image registration, Image analysis

1. INTRODUCTION

Picture enlistment focuses at adjusting of structures or locales precisely over numerous, related pictures procured under various occasions, or at different conditions, or utilizing distinctive modalities [1]. This critical issue in restorative picture handling is a functioning zone of research. Picture enlistment has a huge number of uses in medicinal picture preparing. Picture enlistment is fundamental for picture guided medical procedure, picture guided mediation, radiotherapy arranging, heart perfusion and observing of sickness movement. Investigation of effectiveness of medications, for example, radiotherapy, chemotherapy requires the enrollment of pre-treatment and post-treatment pictures taken from sweeps. Therapeutic picture enlistment may include any number of pictures. This paper centers around medicinal picture enrollment of two pictures. The main picture is called as reference picture and the second picture as the detected picture. The reference picture is kept unaltered and detected picture is changed until it adjusts legitimately with reference picture. The past is agreed with the distinguished picture and the equivalence between the two is estimated. In the event that they are not comparable, the detected picture is re-changed with various arrangements of parameters and closeness between the two is estimated once more.

A main consideration that decides the achievement and adequacy of any enlistment technique is the methodology we utilize for accomplishing the ideal arrangement of change vectors. The scan for variable specification for picture enrollment has been dealt with broadly as a multidimensional improvement problem, which figures the geometric just as force changes at which the information pictures are having maximal closeness with each other.

Therapeutic picture enlistment includes finding the correct change parameters from a gigantic set. Since the set is immense, procedure of advancement is fundamental. An improvement calculation takes a progression of canny estimates of the parameters of change, applies them on detected picture and uses the closeness metric which means the level of exactness of picture enrollment. Picture enlistment is performed by applying the speculated change parameters to the detected picture and deciding the target work on the got pictures. The enlistment procedure proceeds by either speculating or getting new parameters and recalculating the goal work. An advancement calculation refreshes the change parameters until the comparability metric between two information pictures achieves most extreme.

Picture enlistment is a high dimensional issue, computationally exceptionally extraordinary, and includes a ton of neighborhood minima. Standard streamlining procedures are most likely going to get captured in close-by minima. Thusly we go for bio moved figuring's since Nature, a rich wellspring of unique considerations and methodology, rouses analysts and authorities to deal with various issues. The popularity of nature propelled calculation has been ascribed to their productivity, precise outcomes, straightforward and humble calculation. Along these lines, scientists have proposed metaheuristic techniques to accomplish great outcomes.

2. RELATED WORKS

In the most recent decades, specialists have proposed metaheuristic strategies to accomplish great outcomes for the picture enrollment issue. There are different advancement calculations accessible in the writing in which bio-roused heuristic calculations, for example, hereditary calculation (GA), molecule swarm enhancement (PSO), ABC and

bacterial scrounging calculation (BFA) have been created to accomplish quicker intermingling and to limit the calculation time. They are mainstream in restorative picture handling also. Particle Swarm Approach is a populace based stochastic enhancement calculation, presented in 1995 by Kennedy and Eberhart, which looks for an ideal arrangement in the process able hunt space. This system results in a metaheuristic for taking care of non-straight streamlining issues. It depends on the reproduction of the social conduct of winged animals inside a herd. In PSO[1], each single arrangement is a "molecule". The majority of the particles have wellness esteems which are assessed by the target capacity to be improved, and have speeds which direct the flying of the particles. The swarm is introduced with a gathering of arbitrary particles and it at that point looks for optima by refreshing through cycles. In each cycle, every molecule is refreshed by following two "best" values. The first is the best arrangement of every molecule accomplished up until this point. This esteem is known as best arrangement. Another is that, best arrangement followed by any molecule among all ages of the swarm. This best esteem is known as best arrangement. PSO can likewise be viewed as a transformative method which, as opposed to Genetic Algorithms (GAs) and conventional Evolutionary Strategies (ESs) that utilization the aggressive attributes of natural survival, misuses helpful and social angles. Beginning from a generally diffused populace (swarm), singular segments (particles) will in general travel through the hunt space, in the long run bunching in areas where minima are distinguished. Quickly, PSO reenacts characteristic development advancement for looking through an answer with higher quality. PSO approach came about progressively precise and productive for biomedical picture enrollment than GA and other developmental systems, considering the relationship esteem. Consequently[2], PSO beats GAs in picture enrollment application. Also, the extensive flexibility because of stochastic investigation and abuse of the swarm fortifies PSO over other powerful advancement methods. Great union outcome has been gotten.

Taking everything into account, albeit progressively precise examinations must be made with other worldwide and nearby streamlining standards, Particle Swarm Optimization accomplishes empowering results in biomedical picture enrollment. This methodology merits unquestionably further investigation and speaks to a promising open research issue for multimodal restorative picture enlistment.

Firefly calculation is a stochastic streamlining calculation by recreating the blazing qualities of fireflies. The bionics rule of firefly calculation is: the focuses in the seeking space are recreated as the fireflies, and the areas of fireflies speak to the goal work, and the streamlining method of target work is reproduced by fireflies singular fascination and moving technique, use fireflies singular area points of interest and drawbacks to quantify taking care of issue of the goal work, the procedure of firefly singular survival of the fittest which is the advancement emphasis strategy of target work. In firefly calculation, brilliance and engaging quality are two imperative attributes of fireflies [3]. Splendor speaks to the area focal points or weaknesses of fireflies and we have to refresh always the brilliance and engaging quality to locate the best arrangement of the target function. The fluorescence force I

speaks to the target work esteem, the higher splendor implies the situation of the firefly individual is better; the lower brilliance implies the situation of the firefly is more awful. The technique of looking through the best arrangement of the target work using firefly calculation is: Firstly, we irregular produce numerous fireflies in the arrangement space of the goal capacity, and all fireflies convey the distinctive fluorescence force in view of their diverse areas. Also, fireflies with higher splendor can draw in fireflies with lower brilliance and make fireflies with lower splendor move towards themselves in the wake of ascertaining and looking at brilliance, and the new places of fireflies with lower splendor are determined to understand the entire cycle enhancement [4]. At long last, all fireflies will accumulate in the situation of the firefly with the most astounding splendor and the best estimation of target work is found after many position cycles of fireflies. Mutual data enlistment strategy has the characters of high precision and solid power, however the common data work with numerous boundaries effectively prompts the enhancement calculation fall into nearby ideal, so it is difficult to locate the worldwide best arrangement in the picture enrollment. A multi-goals medicinal picture enlistment calculation dependent on firefly calculation and Powell is advanced in this paper. In this calculation, the standardized shared data and the multi-goals technique dependent on wavelet change is embraced, and firefly calculation and Powell strategy are joined to actualize the streamlining methodology of picture enrollment. The calculation can defeat the issue that common data work simple falls into neighborhood ideal and successfully improve the enrollment exactness. Furthermore, firefly calculation has a decent capacity of parallelism, which is significant to improve the speed of therapeutic picture enlistment calculation.

In development calculations, appropriate control of worldwide and nearby pursuit capacities is a urgent issue while enhancing a particular issue. In any case, they negate each other by and by. In fake honey bee settlement, there are three sorts of honey bees: the utilized honey bees, the spectators and the scouts. The utilized honey bees look around the hive and offer data about nourishment sources with the spectators. By thinking about this data, the spectators will in general select a decent nourishment source and look around it for a superior one. In the event that a nourishment source can't be improved, it will be deserted and the utilized honey bee swings to be a scout, endeavoring to locate another source. Being motivated by this savvy conduct of bumble bees, Karaboga and Dervis proposed the ABC calculation for advancement issue. [5]However, as other bio-propelled metaheuristic streamlining techniques, fake honey bee province calculation can be caught into neighborhood optima particularly when it manages multimodal issues because of its inalienable insatiable highlights and update condition of new hopefuls. So as to improve its worldwide hunt capacity, this proposed technique is a novel scan procedure for passerby honey bees by presenting the value of differential advancement calculation for its solid investigation capacity. It is by all accounts a decent method to defeat the detriments of ABC and DE. For go picture enrollment, we propose an improved ABC calculation, called PABC calculation. Torres and Jose first utilized the ABC calculation to tackle the enlistment issue yet they just thought about the standard structure without enhancements. Propelled

by the PSO calculation, another arrangement refreshing procedure is proposed and the utilized stage and passerby time of ABC computation are adjusted. Our dedication is in improving the area look limit and request precision of the standard ABC calculation, particularly to extend picture enlistment issue. In addition, an extra segment speaking to the worldwide best arrangement has accelerated the combination. Additionally, our technique manages awful starting positions, while most customary strategies can't work effectively, as far as anyone is concerned. [6] The investigation results exhibit that the new calculation is increasingly exact, vigorous and quicker than other meta-heuristic calculations when confronting range picture enlistment issue. The confinement of this paper is as per the following. As a metaheuristic calculation, the proposed calculation is slower than those deterministic calculations, for example, FICP. Later on, we will focus on the speed of the PABC and attempt to join it with ICP (the quickest calculation up until this point) in starting emphases, which are truly tedious in the trial.

ACO was first presented by M. Dorigo in 1992. Insect settlement improvement is a nature-enlivened advancement calculation motivated by nourishment searching conduct displayed by subterranean insect social orders. Through some scholar's perspective, the visual tangible organs of this present reality ants are simple ordinarily. The ants convey utilizing a synthetic substance called pheromone. In voyage of a subterranean insect, it collects a steady measure of pheromone that different ants can pursue and on the off chance that it came after the trail, the insect's own pheromone strengthens the present trail, the development in pheromone builds the likelihood of the following subterranean insect choosing the way. [7] Therefore, the more the ants travel on a way, the more alluring the way ends up for sequential ants. After some time, as more ants are able to finish the shorter course. Along these lines on shorter ways pheromone densities remain high since pheromone is set down quicker and the more drawn out ways are less fortified lastly deserted. This strategy for positive criticism in the end drives the ants to pursue the littler ways. It is this typical experience that supported the advancement of the ACO meta-heuristic. Utilizing this sort of strategy, the primary preferred standpoint is that, it extricates noteworthy highlights of the picture, extraordinarily packs the picture data, and has great power, little measure of figuring, quick speed. It just needs four procedures including instatement process, development process, update procedure and choice procedure. Slope in 1993 proposed a component space that conveyed the mix of comparing pixels forces in a lot of two pictures. This element space modifies with the varieties in the arrangement of the pictures. On the off chance that the pictures are precisely enlisted, at that point explicit gatherings for relating anatomical structures in highlight space could be perceived. In the event of non-enrollment, the structures of reference picture don't match to the relating pixels in the objective picture and impacts scattering. This property of the element space allows the utilization of scattering as a picture enrollment measures. Later Collignon and Studholme exhibited entropy as an enlistment measure in 1995. After this P. Voila and Wells proposed shared data as another measure for picture enlistment in 1997 and ended up one of the critical systems of picture enrollment. Shared data can be spoken to in numerous ways. In

this work, another methodology of therapeutic picture enrollment dependent on ACO on smoothed pictures for picture division and for removing focuses' highlights is proposed. Results are gotten for different turn edges. It is deduced that proposed count shows extraordinary selection when skim picture is pivoted at an edge. Additionally, the proposed enrollment calculation is hearty against various picture changes like standard SIFT, other later fluffy and neural based techniques quantitatively. [8] Here enrollment is actualized for single methodology picture enlistment and should be broadened and tried for multimodality picture registration. The parameters which are considered for the outcomes amid execution are handling time, Mutual data and the edge of revolution at which the objective picture is to change in order to get the enlisted picture. At long last the picture acquired best from the ACO utilizing this data is enrolled with the reference picture. Investigations on therapeutic pictures likewise show better effectiveness, time utilization, connection and shared data (entropy) of the proposed calculation when contrasted with numerous standard strategies for the writing.

The bacterial scavenging worldview is a transformative streamlining strategy created in the most recent decade. BFOA is a Swarm Intelligence calculation roused by the social conduct methodology of the *E. coli*. The goal of the microscopic organisms rummaging technique is to amplify the measure of nourishment acquired while moving over the earth. Singular bacteria additionally speak with others by sending signals demonstrating nourishment sources. In the similarity, the earth in which the microbes move speaks to the pursuit space of a streamlining issue, while the measure of supplements at every area is the target work estimation of the comparing arrangement. The development of a microorganism is accordingly the age of another competitor arrangement. Microscopic organisms additionally have a wellbeing status, characterized as the whole of the measure of sustenance discovered amid its lifetime. Every area in the earth has a swarming esteem dictated by the signs sent by adjacent microbes, which is intended to improve or diminish the probability of a bacterium to move to a specific area notwithstanding its measure of nourishment. Toward the start of the streamlining procedure, a lot of microbes is made and put in irregular positions in the inquiry space. At that point, the calculation plays out an iterative procedure in which every bacterium experiences four tasks: development (called chemotaxis), correspondence/swarming, multiplication and elimination. In, scientists acquainted a methodology with highlight based IR utilizing a BFOA with a novel plan. Their proposition beat past bacterial scavenging approaches and acquired a focused act when contrasted with the most significant best in class IR techniques. The calculation additionally positioned among the best calculations in a broad near examination over various component based IR issues. Our calculation can convey more exact arrangements in the greater part of the cases, however it every so often conveyed low-quality outcomes. A future augmentation of this work will concentrate on this particular inadequacy by structuring a novel system for the utilization of the nearby inquiry process. The calculation can utilize diverse change models and comparability measurements. The parameters of the change are

encoded in a genuine esteemed vector that speaks to the situation of a bacterium, while the wellness work is straightforwardly the comparability metric of decision

The most vital advance in Genetic Algorithm is to pick the target work which is utilized to assess the wellness of every chromosome. The wellness esteem is dictated by the closeness measurements which is the goal work. Here standardized work for GA process. The outcome gotten by standardized connection is contrasted and common data technique which is evaluated by mean squared blunder. [9] If the best change isn't acquired, a streamlining agent is utilized to locate the ideal change. Hereditary calculation is utilized to locate the best change. The inquiry procedure utilized is parameter based technique. The most essential advance in GA is to pick the target work which is utilized to assess the wellness of every chromosome. The wellness esteem is dictated by the comparability measurements which is the goal work. Here standardized connection is utilized as the target work for GA process. The outcome gotten by standardized connection is contrasted and common data strategy which is evaluated by mean squared blunder. Genuine encoding is utilized than parallel encoding. Effectiveness of GA is expanded since there is no transformation to paired sort and diverse hereditary administrators can be utilized. So the encoding includes the change parameters straightforwardly. It is spoken to by five genuine numbers, to be specific one turn parameter (τ), two interpretation parameters (t), and two scaling parameters (s). [10] GA cycle pursues four procedure wellness assessment, determination, recombination and production of new populace. Introductory populace is set to 50 chromosomes. Standardized connection is utilized to discover the likeness for every change and assessment of this target work called wellness esteem is determined for every chromosome in the populace. Subsequent stage includes choice of fittest people. Competition technique requires more execution time and thus Roulette's wheel strategy is utilized. Most noteworthy fit people are chosen and hereditary administrators, for example, hybrid and transformation are connected to make cutting edge populace. Here number juggling hybrid is used. the succeeding ages will contain the posterity and furthermore the best fit people from its former ages. Change administrators haphazardly pick one of the person in the chromosome and supplant it by an arbitrary incentive in its range. Wellness esteem is determined for the cutting edge people. This procedure is proceeded for some ages. Ceasing criteria picked is greatest age. All things considered, as age builds, best wellness, for example best change can be gotten. The procedure is proceeded until wellness esteem achieves high so the enrollment finishes. The worldwide ideal is accomplished by making new populace from people of existing population. It can be seen that in both the cases, standardized relationship indicated better assembly and furthermore the MSE incentive to be less when contrasted and MI. It is seen that as ages' expands, the wellness esteem increments. Higher the wellness esteem and increasingly steady it is, better the combination. In future work, execution of power based and include based techniques might be investigated.

The dark wolf streamlining agent is a meta-heuristic method which is utilized to discover answers for enhancement issues. These procedures locate the best answer for an issue with the

imperatives of the time required and the measure of data known. They are appropriate to an assortment of issues without changing their essential structure in the dim wolf analyzer calculation the best arrangement is named as alpha, the second best arrangement is called beta and the third best arrangement is called gamma. The remainder of the arrangements is named as omega. The arrangement development instrument of this calculation comprises of three stages. [11] The principal stage comprises of scanning for the arrangement for example following, pursuing and moving toward the prey regarding dim wolves. The second stage comprises of misusing the scan space for discovering better arrangement's for example seeking after the prey. The last stage comprises of tackling the issue dependent on the best arrangement for example assaulting the prey. This is another system identified with swarm insight. In swarm insight, dissimilar to other critical thinking systems a lot of specialists at the same time build arrangements. It is an iterative way to deal with critical thinking. The dim wolf streamlining agent is another methodology and has not been connected in numerous zones. [12] This calculation is proposed dependent on dim wolf streamlining agent for taking care of the picture enlistment issue. In the proposed calculation a direct change model will be utilized to be specific the 'Relative change' to play out the suitable change. The relative change has numerous focal points. The relative changes save the collinearity condition and proportions of separations. This utilization a blend of different activities like: Rotation, Translation, Reflection, Shear and Similarity Transformations. As the initial step an example picture will be taken as the reference picture. The picture that must be enlisted will be known as the source picture. The quantity of operators or dim wolves that will look for arrangement will be corresponding to the span of the reference image. The specialists will utilize irregular relative change esteems to locate the underlying arrangement. After the main emphasis the nature of the change esteems acquired by various specialists will be determined. This quality will be founded on the comparability measure w.r.t. the reference picture given by. This likeness measure is utilized in light of the fact that it gives a decent speed act tradeoff when contrasted with other approaches. After ascertaining the similitude metric for every one of the operators the best three specialists will be chosen. After this progression the various specialists will change the grid gotten by the best three operators accordingly misusing the inquiry space around the best arrangement. In the following emphasis the three best operators will register new irregular lattice from the source picture (investigating). This procedure proceeds till the source picture is totally enlisted with the objective picture for example it has the most extreme comparability esteem conceivable In the present research work another calculation is proposed for taking care of the issue of picture enrollment. An altogether new procedure utilizing Swarm Intelligence is proposed. By and by just the essential structure calculation is displayed. As a future work the calculation should be executed and contrasted with different methodologies. The different parameters of the calculation like number of operators and comparability factor can likewise be changed in accordance with check for the best estimation of the parameters. The

calculation can likewise be stretched out to manage unsure information and multimodal pictures.

Cuckoo look (CS) is a meta-heuristic calculation roused by the cuckoo feathered creature, these are the "Brood parasites" winged creatures. It is difficult to make its home and spot its eggs in the homes of different winged creatures. Some steward fowls can connect legitimately with the other cuckoo that goes to claim home. The host winged creature perceives the eggs on the off chance that they have a place with its home or not. In the event that the eggs are not having a place with it, it will discard the eggs or evacuate the home and manufacture another. As indicated by this marvel, assume that each current egg is an answer and cuckoo egg is another and serviceable arrangement. Subsequently, for each home, there has one egg of cuckoo in which each home will contain different eggs that shows up as a gathering of arrangements. All intents and necessary, any new egg put by cuckoo goes about as an exceptional settling to the hunt calculation and earlier the execution of the following stage, a circulation method equation characterizes the quantity of outstanding eggs. The new number of eggs can be spoken to as the people for the following emphasis; in this way, expanding the number of emphases is smarter to get improved results.[14] The cycles carry on until fulfilling the ideal enhancement. Right away, CS calculations and morphological tasks are definitely used to enlist the picture by deciding the variable parameters. CS calculation turned out to be truly pertinent in numerous streamlining fields and it's praiseworthy for how the childhood conduct [7] since it has been effectively executed to illuminate the planning issues and structure enhancement issues, for example, discourse acknowledgment, work booking, and worldwide advancement. That problem shaped a pool of research to develop a strategic distance from or moderate picture clamor to clear up a picture highlights which decidedly add to many picture preparing activities, for example, the picture division, picture recognition, include extraction, edge identification and others. The achievement disclosure of Cuckoo Optimization Algorithm (COA) in the picture preparing world has maximally improved the picture enlistment methods by limiting the human intercession in the picture activities utilizing a counterfeit choice of picture parameters to advance the picture handling calculation.

One of the modern, swarm insight calculations, propound in 2010 by Tan and Zhu, is the firecrackers calculation (FWA). As a result of the wide employment of the firecrackers calculation for various enhancement concerns, a wide range of alterations, upgrades and hybridizations of the calculation were propound. Creators of the first firecrackers calculation kept on taking a shot at its improvement. The outcomes are four overhauled adaptations of the FWA, upgraded FWA, and corporative structure for FWA [40], FWA with improved cooperation. In the proposed work another improvement of the upgraded firecrackers calculation (EFWA) in light of a versatile powerful nearby hunt system is performed. Here we think about unbending changes, interpretation and revolution parameter for picture enrollment strategy. For closeness measure we utilized standardized common data given. Target work for picture enrollment that utilizes common data for comparability estimation has various neighborhood maxima thus worldwide enhancement seek is required. We embraced

and balanced ongoing swarm insight firecrackers calculation. Standardized shared data for two pictures can't surpass the esteem that is acquired when two pictures are equivalent. In any case, when the image is interpreted by only one pixel or pivoted by just 1 degree, standardized common data changes essentially. [15] Such target work is troublesome since the worldwide ideal is covered up in an extremely limited well, the remainder of the hunt space being generally level with various nearby optima. In view of these perceptions, the firecrackers calculation was balanced. Toward the starting, wide hunt is required so as to cover seek space with plan to locate that tight space where worldwide most extreme is. Number of hopeful arrangements (flashes) should be a lot bigger than for most applications so as to accelerate the underlying hit near the worldwide ideal. Be that as it may, adequacy coefficient ought to be little since outside the thin territory of the worldwide ideal it doesn't do misuse, closer or more extensive. When that tight space has been discovered, abuse ought to be exceptionally fine with little advances. In our proposed technique this was accomplished by lessening the range quadratic partner with the advancement of evaluations for the hard streamlining issue of inflexible picture enlistment .we balanced ongoing firecrackers calculation and tried it on pictures from datasets utilized. Since the calculation couldn't discover arrangements utilizing full goals pictures, proper goals decrease was resolved that encourages introductory course outcomes and parameters were tuned with the goal that the two phases of the method participate ideally. We contrasted our methodology and 6 different strategies from writing and it beat every one of them. Our calculation prevailing with regards to enrolling pictures in all cases, including huge relocation. That builds up firecrackers calculation as a predominant apparatus for unbending picture enrollment. We didn't utilize the various leveled approach with numerous goals so later on that can additionally improve results, for the most part the execution time.

3. CONCLUSION

The IR issue is a remarkably astonish concern in the field of picture intercourse with. The examination of continuous chase and upgrade figuring's associated with IR has offered new perspectives to manage this test. The responsibility of this paper was watching out for usage of framework, settling the organizing and mapping considering two point-sets. The offers different plan parameters and limits. We see that the significance of the fundamental masses, which is by and large instated with unpredictable entries, is essential to the looking for advancement. As future works, we are evaluating pondering an authentic world application.

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