Asian Journal of Applied Science and Technology (AJAST)
Volume 1, Issue 3, Pages 196-198, April 2017

Identification of Original Gold Using Statistical Method

S.Jagadeeswari[1] and P.Dharani Devi[2]

[1]*UG Scholar, Department of Electronics and Communication Engineering, IFET College of Engineering, Villupuram. India.*
[2]*Associate Professor, Department of Electronics and Communication Engineering, IFET College of Engineering, Villupuram. India.*

Article Received: 28 March 2017 *Article Accepted: 08 April 2017* *Article Published: 13 April 2017*

ABSTRACT

Fresh technologies are been designed for judgment of treasured metals and their Purity Content are taken into consideration crucial .The best and global identified approach is Cupellation for clear-cut willpower of gold. Another faster and non-damaging approach is X-Ray Fluorescence and karat meter which may additionally offer the accurate result and more system used for the approach isn't always without difficulty to be had and excessive cost. In my undertaking identification of original gold is achieved my statistical approach where a statistical Parameter are calculated, the calculated parameters are mean, variance, standard deviation ,energy , Correlation , contrast , homogeneity. Then the intended values are as compared with predefined values based on the deviation.

Keywords: Statistical Parameter, Predefined values, Global identified approach and Excessive cost.

1. INTRODUCTION

The power deliver needed for the X-Ray sources is 50-70kv,60-300mW And X-Ray tube used right here is more steeply-priced component. And the slight ray emitted by using the X-Ray property is very risky for all dwelling matters. The researchers ought to get a felony permission from the government, then best they permit to apply the X-Ray tube for the software.

To remedy this issues, I visit my proposed technique, using picture processing can emerge as privy to the originality of gold .And tools used for to do that task is MATLAB2013. In statistical evaluation approach the statistical parameters are calculated, the parameters are suggest, variance, popular deviation, assessment, correlation, energy, homogeneity. And the calculated parameters are as compared with the predefined value. Based at the deviation we are able to decide the steel is gold or not.

2. LITERATURE SURVEY FIRE ASSAYING TECHNIQUE

The fire assay approach makes use of excessive temperature and flux to 'melt' the rock and allow the gold to be collected. Lead fashioned from the bargain of litharge (PbO), is historically used because the amassing medium for silver and gold. The test pattern is intimately blended with a appropriate flux so that you can fuse at high temperature with the gangue minerals present inside the pattern to produce a slag that is liquid on the fusion temperature. The liberated valuable metals are scavenged via manner of the molten lead and gravitate to the bottom of the fusion crucible. Upon cooling, the lead button is separated from the slag and processed in a separate furnace for a high temperature oxidation (cupellation) wherein the lead is eliminated, leaving the precious metals in the back of as a steel bead called a prill. Traditionally this prill became then partially dissolved in nitric acid (parted) to get rid of silver and the ultimate gold determined via way of weighing (gravimetry). Alternatively, the prill can be dissolved in a mixture of hydrochloric and nitric acid (aqua regia) and the attention determined through spectroscopic strategies (AAS, ICPAES or ICPMS). The interest is generally expressed as elements consistent with million (ppm), this is same to grams in line with tonne (g/t).

TOUCHSTONE TECHNIQUE

There are some clinical techniques for precisely figuring out karat gold purity, a few detrimental (fireplace assay) and others nondestructive (X-ray fluorescence). Both techniques require steeply-priced equipment, unique techniques and a nicely-lit and ventilated location. A simpler method for determining gold purity in jewelry is the "touchstone" checking out system, an age-old method this is relatively nondestructive to earrings and gives short consequences**.**

PARTING REFINING PROCESS

The approach does have a few dangers in that small, but significant, losses of gold are likely to get up inside the dissolution and filtering ranges. Furthermore, the equipment, of necessity, is made in glass so that it will resist the aqua regia. There are also environmental considerations which want to be addressed due to the emission of gases (nitrogen oxide, hydrogen chloride and sulphur dioxide) and solutions are produced that could encompass nitrates, nitrites, chlorides, sulphides and sulphates and which have to be disposed of. Nevertheless, for the producers/refiners who're dealing in huge part with immoderate carat gold alloys (18 carat and above), then this method is probably the maximum financial and several equipments are to be had commercially that may deal with several kg in line with day.

However, for decrease caratage alloys, inquartation and parting turns into a most attractive possibility procedure and this paper gadgets out the thoughts of the technique and then outlines a gadget that has lately become to be had,

together with results of a refining trial the use of 9 carat gold scrap.

MODERN TECHNIQUE ELECTRONICS GOLD PEN

To use a gold testing pen, hold the pen cord beneath the test steel, rub the point of the pen's tip onto the pinnacle of the metallic, permit the gold metallic dissolve into an ink onto the end of the pen, and use the ink to draw a line on a chunk of paper. The color of the ink determines the kind and pleasant of the gold. It's vital to simplest conduct the test on brilliant steel surfaces.

A resistance to nitric acid identifies most gold and valuable metals, however acid can't tell the difference among white platinum gold and other white metals. Many digital testers additionally omit white gold and vintage yellow gold. Pens paintings well to pick out these varieties of gold, and also can display that a few gold has more karats than found out via acid tests.

GOLD TESTING BY CHEMICAL PROCESS

1. Sampling: a representative proportion is taken.

2. Fusion: the sample is melted in a crucible with appropriate fluxes and other agents so that droplets of lead collect the valuable steel and descend through the pattern within the crucible. The lead alloy is cooled to produce a metallic "button," and the slag is discarded.

3. Cupellation: the button is melted in an oxidizing surroundings in an effort to oxidize impurities, consisting of lead and other metals. The silver melts and dissolves the other treasured metals, forming a "bead" of silver, gold, and platinum metals on occasion referred to as dore.

4. Weighing: the bead is weighed to decide the overall of gold and silver (the platinum metals are found in too little amount to affect the size).

5. Parting: the bead is dealt with warm dilute nitric acid to dissolve out the silver. If the gold content material of the bead is thought to exceed 25 percent, its attention is first reduced through including silver in a procedure called inquartation.

6. Weighing: the remnant of gold is weighed and subtracted from the gold-silver bead weight to present the weight of silver.

3. EXISTING SYSTEM X RAY FLUORESCENCE TECHNIQUE

XRF (X-ray fluorescence) is a non-destructive analytical technique used to determine the elemental composition of materials. XRF analyzers determine the chemistry of a sample by measuring the fluorescent (or secondary) X-ray emitted from a sample when it is excited by a primary X-ray source. Each of the elements present in a sample produces a set of characteristic fluorescent X-rays ("a fingerprint") that is unique for that specific element, which is why XRF spectroscopy is an excellent technology for qualitative and quantitative analysis of material composition.

ADVANTAGES

The fluorescence spectroscopy (XRF) is now properly hooked up and can be with ease utilized with modern device. XRF contraptions have the following benefits:

Non-unfavorable
Fast
Clean
Safe
Universally applicable

EDXRF METHOD

EDXRF is the generation generally utilized in transportable analyzers. EDXRF is designed to analyze agencies of elements simultaneously so one can swiftly decide the ones elements gift in the pattern and their relative concentrations—in other words, the basic chemistry of the sample.

Energy dispersive X-ray fluorescence era (ED-XRF) presents one of the only, maximum accurate and most financial analytical strategies for the determination of the chemical composition of many styles of substances. It is non-adverse and reliable, calls for no, or little or no, pattern education and is appropriate for strong, liquid and powdered samples. It can be used for a wide variety of factors, from sodium (11) to uranium (ninety two), and offers detection limits on the sub-ppm stage, it is able to also degree concentrations of up to a 100% effortlessly and concurrently.

4. PROPOSED SYSTEM

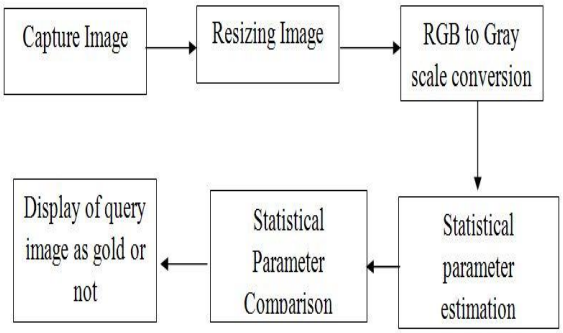

Fig 1. Block diagram

In this venture the metallic pics can be captured by using the virtual digital camera, then the captured picture can be resized for the 256X256 matrix length .The main motive of resizing the picture is to lessen the quantity of reminiscence area had to save the virtual picture. Then the resized picture can be given to the RGB to Gray conversion system, the colour picture may be transformed into the gray scale photograph, which consist simplest black and white pixels in a picture. The intensity of black photo is 1 and white image is 1.The most important cause of RGB to Gray conversion is most of the algorithms are not appropriate for the RGB image and channel had to transmit a RGB image is excessive. Statistical parameters are been calculated to

discover the originality of gold, mean, standard deviation, variance, energy, contrast, correlation, homogeneity are calculated. For a group of photo the statistical parameters are calculated and maintaining a database. With help of database price the presently processed photo parameters are compared based on the deviation one can pick out the question photo is gold or not.

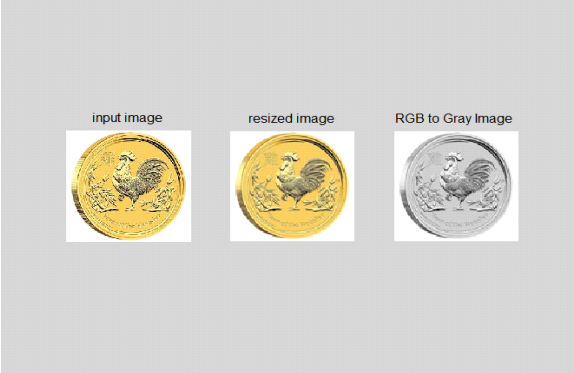

Fig 2. Output image

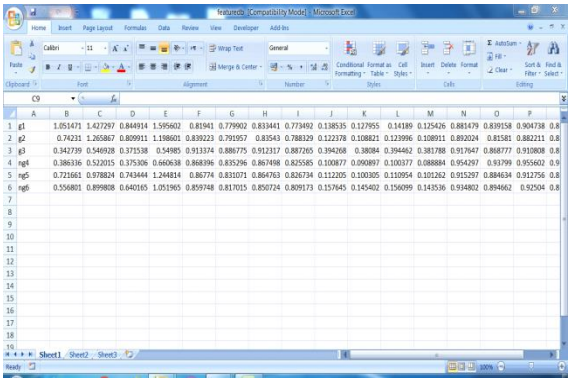

Fig 3. Excel database

ADVANTAGE

This technique is easy to use.
It offers User friendly handling.
As based on most effective photo evaluation it offers the instant outcomes at any area any time.
The photo of item is captured via any android cellular telephone camera.

DISADVANTAGES

All the strategies are carried at the photos of object handiest. If the metal is lined with any gold like metallic which includes copper or bronze then because the composition of metal items aren't taken into consideration. So, the results which can be acquired are approximate close to specific effects.

APPLICATION

Commercial factor of view.
Individual inspection can be achieved.
In the jewelry shop the inventory control can be carried out with the help of proposed technique.

5. CONCLUSION

With the assist of Image processing and matlab the advanced technique offers smooth and instantaneous analysis of any object as gold object or now not. It offers the results which might be about near the precise results. With the assist of proposed technique and similarly work on assaying any metal object you can still expand the system which can calculate the karat percentage of Gold gadgets for the purity verification of any gold item.

6. FUTURE SCOPE

Develop the proposed method as mobile application with the help of java coding.

REFERENCES

[1] Anzelmo, John A. and Lindsay, James R. *Journal of Chemical Education, September* 1987, 64(9). A200-A204.

[2] Buhrke, Victor E.; Jenkins, Ron; Smith, Deane K. A Practical Guide for the Preparation of Specimens for X-Ray Fluorescence and X-Ray Diffraction Analysis. 1998, *John Wiley & Sons, Inc. QD96.X2P73 ISBN 0-471-19458-1.*

[3] Ferrero, J. L. et al. X-Ray Spectrometry, 2002, 31, 441-447.

[4] Mohammed, M.A., Ahmad, M.S. and Mostafa, S.A., 2012, June. Using genetic algorithm in implementing capacitated vehicle routing problem. *In Computer & Information Science (ICCIS), 2012 International Conference* on (Vol. 1, pp. 257-262). IEEE.

[5] Obaid, O.I., Ahmad, M., Mostafa, S.A. and Mohammed, M.A., 2012. Comparing performance of genetic algorithm with varying crossover in solving examination timetabling problem. *J. Emerg. Trends Comput. Inf. Sci*, 3(10), pp.1427-1434.

[6] Mohammed, M.A., 2015. Design and Implementing an Efficient Expert Assistance System for Car Evaluation via Fuzzy Logic Controller. *International Journal of Computer Science and Software Engineering (IJCSSE)*, 4(3), pp.60-68.

[7] Mohammed, M.A., Al-Khateeb, B. and Ibrahim, D.A., 2016. Case based Reasoning Shell Framework as Decision Support Tool. Indian Journal of Science & Tech., 9(42).

[8] Mohammed, M.A., Belal, A.K. and Ibrahim, D.A., 2016. Human Interaction with Mobile Devices on Social Networks by Young and Elderly People: Iraq a Case Study. Indian Journal of Science and Technology, 9(42).

[9] Hameed, A.H., Mostafa, S.A. and Mohammed, M.A., 2013. Simulation and evaluation of WIMAX handover over homogeneous and heterogeneous networks. *American Journal of Networks and Communications*, 2(3), pp.73-80.

[10] Mostafa, S.A., Ahmad, M.S., Mohammed, M.A. and Obaid, O.I., 2012. Implementing an expert diagnostic assistance system for car failure and malfunction. *IJCSI International Journal of Computer Science Issues*, 9(2), pp.1694-0814.