International Journal of Engineering Sciences & Research Technology

(A Peer Reviewed Online Journal)
Impact Factor: 5.164

IJESRT

IJESRT
INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

LUT & ATIM STUDY IN IMAGE PROCESSING TECHNIQUES

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DOI: https://doi.org/10.29121/ijesrt.v10.i1.2021.14

ABSTRACT

For real-time inspection of color, the LUT approach is the best of the techniques considered. In computer science, a lookup table is an array that replaces runtime computation with a simpler array indexing operation. The savings in terms of processing time can be significant, since retrieving a value from memory is often faster than undergoing an expensive computation or input & output operation. The tables may be precalculated and stored in static program storage, as part of a program's initialization phase, or even stored in hardware in application-specific platforms. Lookup tables are also used extensively to validate input values by matching against a list of valid items in an array and, in some programming languages, may include pointer functions to process the matching input. The disadvantage of the LUT approach is the large memory size. The memory size has been reduced significantly by applying a multitude of ROM compression methods.

1. INTRODUCTION

ATIM study: Thermal inertia is a measure of the resistance of surface materials to a change in temperature and can be related to particle size,bulk density and cohesion. Surfaces dominated by loose dust have lower thermal inertia and typically high albedo, whereas those dominated by rock or duricrust have higher thermal inertia. The fine-component thermal inertia is the thermal inertia of the surface after the thermal radiance attributable to the rocky component is factored out.

2. MATERIALS AND METHOD

Thermal inertia is the key property controlling the diurnal surface temperature variations, and is dependent on the physical character of the top few centimeters of the surface. It represents a complex combination of particle size, rock abundance, exposures of bedrock, and degree of induration.

Thermal inertia defined as the equation:

;Where

$$I \equiv \sqrt{\kappa \rho c} \quad ;\text{Where} \quad \begin{aligned} \kappa &= Thermal\ conducivity; \\ \rho &= Density; \\ c &= Heat\ capacity \end{aligned}$$

Simple or apparent thermal inertia can be easily calculated by using simple model & using the phase angle information of the diurnal temperature change. The advanced thermal inertia can be calculated by using model which is developed and based on first-order approximation operational thermal inertia model and second-order approximation for the boundary conditions and a second-order approximation for the surface temperature series expression. By this method the real thermal inertia i.e.,as distinct from apparent thermal inertia can be computed directly. The model requires field measurement parameter for the calculation of real thermal inertia; this is the time of maximum temperature in the daytime and this parameter is easily obtained from a meteorological station. For the regions having vegetative cover, the thermal inertia value is the weighted thermal inertia values of vegetated cover and soil ground.

ISSN: 2277-9655
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3. RESULT

- Code generated for LUT:
- Code generated for LUT approach in the contex of cdf frequency:

```
• z=imread('4.jpg');
• r=size(z,1);
• c=size(z,2);
• zh=uint8(zeros(r,c));
• n=r*c;
• f=zeros(256,1);
• pdf=zeros(256,1);
• cdf=zeros(256,1);
• cum=zeros(256,1);
• out=zeros(256,1);
• for i=1:r
•     for j=1:c
•         value=z(i,j);
•         f(value+1)=f(value+1)/n;
•     end
• end
• sum=0;L=255;
• for i=1:size(pdf)
•     sum=sum+f(i);
•     cum(i)=sum;
•     cdf(i)=cum(i)/n;
•     out(i)=round(cdf(i)*L);
• end
• for i=1:r
•     for j=1:c
•         zh(i,j)=out(a(i,j)+1);
•     end
• end
• figure,imshow(zh);
• h=histeq(z);
• figure,imshow(h);\
```

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Impact Factor: 5.164
CODEN: IJESS7

Raw image

Out-put
Figure 1: Project model.

4. DISCUSSION

Simple or apparent thermal inertia can be easily calculated by using simple model & using the phase angle information of the diurnal temperature change. The advanced thermal inertia can be calculated by using model which is developed and based on first-order approximation operational thermal inertia model and second-order approximation for the boundary conditions and a second-order approximation for the surface temperature series

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

expression. By this method the real thermal inertia i.e.,as distinct from apparent thermal inertia can be computed directly.

5. CONCLUSIONS

The model requires field measurement parameter for the calculation of real thermal inertia; this is the time of maximum temperature in the daytime and this parameter is easily obtained from a meteorological station.For the regions having vegetative cover, the thermal inertia value is the weighted thermal inertia values of vegetated cover and soil ground.

6. ACKNOWLEDGEMENT

The authors express their gratitude to the Professors & students of Department of Remote Sensing BIT, Mesra Dept. of Earth science, Civil, IITG for extending the research facilities in the Laboratory & institution.

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