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Geometric Characteristics of the Linear Features in Close Range

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ABSTRACT:- The accuracy of photogrammetry can be increased with better instruments, careful geometric characteristics of the system, more observations and rigorous adjustment. The main objective of this research is to develop a new mathematical model of two types of linear features (straight line, spline curve) in addition to relating linear features in object space to the image space using the Direct Linear Transformation (DLT). The second main objective of the present paper is to study of some geometric characteristics of the system, when the linear features are used in close range photogrammetric reduction processes. In this research, the accuracy improvement has been evaluated by adopting certain assessment criteria, this will be performed by computing the positional discrepancies between the photogrammetrically calculated object space coordinates of some check object points, with the original check points of the test field, in terms of their respective RMS errors values. In addition, the resulting least squares estimated covariance matrices of the check object point's space coordinates. To perform the above purposes, some experiments are performed with synthetic images. The obtained results showed significant improvements in the positional accuracy of close range photogrammetry, when starting node, end nodes, and interior node on straight line and spline curve are increased with certain specifications regarding the location and magnitude of each type of them.

KEYWORDS:- Accuracy -linear features - geometric characteristics- close range photogrammetry

I. INTRODUCTION

In the region there Bacan Island Nature Reserve Mount Sibela (CAGS). Local communities that are around the area CAGS harness the potential of forests by exploiting species, flora resources to meet daily needs, such as rottan, indigo sap, wood, and other forest products. Hunting of some animals also carried out, for example, black monkeys, several species of birds, and deer. So far, there has been no breeding activity against several species of flora and fauna valuable forest ecological and economical. This is because of the knowledge society to attempt the cultivation of flora and fauna is still limited. Exploitation activities are carried out continuously without any effort cultivation, can reduce the diversity of certain species of flora and fauna, which will eventually lead to the scarcity of the species of flora and fauna [10]. If this situation continues, it is feared at a time not too long and endangered species endemic to this Bacan Island would be locally extinct. The availability of different types of butterflies in Bacan island and surrounding areas, is the main attraction in the region and add to the exotic nature reserve of Mount Sibela. In addition to providing the charm and beauty of nature with the acculturation of color on the body and wings, butterflies also play a role as pollinators in the ecosystems through pollination in various plant species. Role is very important for the sustainability and balance of the ecosystem, so that the existence of butterflies in nature is one indicator of ecosystem damage. The decline in the population of butterfly in nature caused by forest conversion, illegal logging, habitat fragmentation, and illegal arrests.

One way to maintain butterfly populations in nature is the outreach to the community and do captivity. Breeding activities can be carried out in natural open, semi-closed, and closed. This activity can increase the income of people in Bacan Island and surrounding islands, which in turn will increase the level of social welfare. The study of the diversity of butterfly in Bacan island, can be based on data and molecular ecology. Ecological data obtained in the form of population estimation, richness and abundance of species, and vegetation analysis (important value index), while the data were examined in the form of molecular and phenotypic analysis of genetic relationships butterfly on Bacan island. Overall the data butterflies can be a database for potential development of a butterfly through conservation efforts are quite popular today that ecotourism or eco-eduwisata.

The principle of this conservation effort is to utilize the natural potential of an area to be used as a tourist attraction. Tours are conducted aims to encourage conservation activities in the area. The advantage of this kind of conservation effort is the active involvement by local people to support conservation efforts. Local residents will indirectly acquire additional revenue from tourists who visit, so that conservation efforts will

benefit all parties involved. To realize conservation through ecotourism development efforts, it is necessary to synergy of local communities by researchers so that the results obtained through this research can be applied by the community. The purpose of this research is to study the density and distribution of species of butterfly in three locations Bacan Island.

II. THE PROPOSED MATHEMATICAL MODEL

The direct linear transformation (DLT) model was introduced to the photogrammetric community by Abdel-Aziz and karara (1971).It has gained a wide popularity in close range photogrammetry, computer vision, robotics and biomechanics. The wide popularity of the DLT is due to the linear formulation of the relationship between image and object coordinates. The object point, its image on photographs and perspective center all lies on the same straight line. This case is expressed by the collinearity equations, which are the basis for the computation of object space coordinates of points in photogrammetry. The direct linear transformation (DLT)

III. RESULTS AND DISCUSSION

From this study has identified as many as 34 species with a total of individuals observed in the threepoint Bacan island as much as 424 individuals, and are grouped into four families. A complete list of species of butterflies the observed from the location of the specimen can be seen in Table 1 below:

Table 1. Species composition Butterfly Found in Bacan Island

Location	Nr	Species	Family	Habitat
BACAN ISLAND	1	*Papilio Ulysses*	Papilionidae	Point 1,2 and 3
	2	*Ornithopthera Croesus*	Papilionidae	Point 2 and 3
	3	*Troides criton*	Papilionidae	Point 1,2 and 3
	4	*Papilio polytes*	Papilionidae	Point 1
	5	*Graphium Agamemnon*	Papilionidae	Point 1,2 and 3
	6	*Graphium Deucalion*	Papilionidae	Point 1
	7	*Eurema candida*	Pieridae	Point 1 and 3
	8	*Appias paulinus*	Pieridae	Point 3
	9	*Catopsillia Pomona*	Pieridae	Point 3
	10	*Appias albino*	Pieridae	Point 1 and 3
	11	*Delias candida*	Pieridae	Point 1
	12	*Delias poecelia*	Pieridae	Point 3
	13	*Taenaris m. macrops*	Pieridae	Point 1
	14	*Anthraea* sp.	Pieridae	Point 3
	15	*Gandaca* sp.	Pieridae	Point 2 and 3
	16	*Lexias aeropa eporidorix* (Fruhstorfer, 1913)	Nymphalidae	Point 1
	17	*Cirrochroa regina*	Nymphalidae	Point 1 and 3
	18	*Acraea molluccana*	Nymphalidae	Point 1,2 and 3
	19	*Hypolimnas misippus*	Nymphalidae	Point 1,2 and 3
	20	*Hypolimnas b. bolina* (Linnaeus, 1758)	Nymphalidae	Point 2 and 3
	21	*Euploea phaenareta*	Nymphalidae	Point 1 and 2
	22	*Hypolimnas alimena eligia* (Fruhstorfer, 1912)	Nymphalidae	Point 1 and 3
	23	*Hypolimnas antilope quinctinus* (Fruhstorfer, 1912)	Nymphalidae	Point 3
	24	*Apaturina erminea ribbei* (Röber, 1894)	Nymphalidae	Point 2 and 3
	25	*Pareronia jovaea*	Nymphalidae	Point 3
	26	*Cupillia icylla*	Nymphalidae	Point 3
	27	*Cuphas myronides*	Nymphalidae	Point 3
	28	*Ivlelanitis leda*	Nymphalidae	Point 3
	29	*Hebomoia glaucippe*	Nymphalidae	Point 3
	30	*Jamides boschus toscius* (Fruhstorfer, 1916)	Lycaenidae	Point 1 and 3
	31	*Jamides seminiger* (Grose-Smith, 1895)	Lycaenidae	Point 2 and 3
	32	*Bindahara phocides*	Lycaenidae	Point 1,2 and 3
	33	*Jamides philatus emetallicus* (Druce, 1895)	Lycaenidae	Point 1 and 3
	34	*Danis danis philostratus* (C. & R. Felder, 1865)	Lycaenidae	Point 1 and 3

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