

# Anthropometric classification of Nasal Indexes for a Sri Lankan Undergraduate Student Population

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Whilst the human nose is a predominant facial feature of ones face where it is used in assessing ones beauty, in the field of anthropometric studies, its index is used in a number of clinical and forensic practices. This index is the most commonly used method in classifying the human nose into different categories. The calculation of which is done by dividing the nasal breadth by the nasal height and multiplying the result by 100, where;

Nasal breath: Maximum breadth of the nasal cavity (at right angles to the nasal height), from alare to alare (al)

Nasal height: height from nasion (n) to nasospinale (ns)

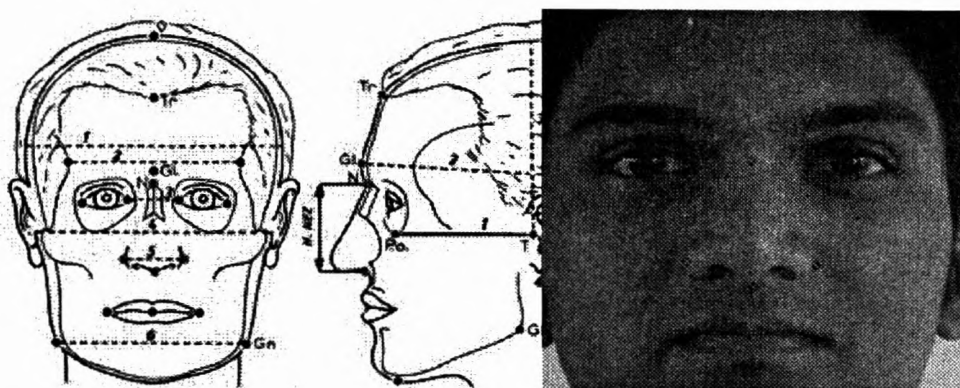


Fig. 1a, depicts anthropometric locations of the human face which are used to calculate the Nasal index. b. Automated feature point detection using the application developed.

Whilst comprehensive studies have been performed in most countries pertaining classifying nasal indexes, such a study has not yet been conducted in Sri Lanka. The aim of this research is to classify nasal indexes of a target group comprising of both male and female undergraduate students (aged 23-26) using automated facial feature detection techniques.

It is observed that medical studies done in this area have used manual techniques such as sliding vernier calipers to obtain measurements for the nasal index. But following such techniques will undoubtedly bring a human error to an anthropometric calculation which needs to be precise, if one were to study variations of which in a broad manner. Therefore we have used a known multi-platform library, Luxand FaceSDK to develop an application (fig. 1b) to automate the measurement of the nasal breath/height via the libraries' facial feature detection functions. Once the required feature points are detected using the library, the pixel distance extraction and index calculations were done

via an application developed using Java. With regard to the photographs the following conditions needs to be met.

1. Neutral expression
2. Frontal-view
3. Fixed distance from camera to the subject ( Due to pixel calculation and library errors)

A further improvement in this study is that for all subjects, his or her weight and height will also be recorded. We believe that the variations of the nasal index will be studied more effectively with these added dimensions where we will now be able to analyse indexes pertaining to groups devised from the BMI. (In an earlier research this was studied using 3 loosely defined categories; Over/Medium/Under-weight).

The following table presents the averaged nasal index values for a sample group of 50, consisting of students aged 23-26, with the standard deviation of each group.

TABLE I

NASAL INDEX VALUES FOR THE 23-26 SAMPLE GROUP

	Under Weight Female	Under Weight Male	Healthy Weight Female	Healthy Weight Male	Over Weight Male
Mean	89.0088	98.0088	90.5335	101.9613	103.0099
STD	11.4756	10.5494	4.5817	7.2844	3.5493

It is stated in various literature that this classification is utilized mostly by clinicians, plastic surgeons and forensic anthropologists of the countries where such studies have been done for various reasons. The more common usage includes;

1. Forensic facial reconstruction; reconstruct the nose of the deceased person
2. For better treatment of congenital or post-traumatic disfiguration
3. A reference data for plastic surgery (Rhinoplasty)
4. Analysis and classification of fossil remains.
5. Studies pertaining to devising ethnicity, race or sex of a target population

Relating to this study, the devised values will be mainly used for the addition of facial components in a research study where forensic facial reconstruction is conducted based on local tissue thickness sample data. Once more data is collected related to the nasal index calculations, we hope to study index patterns (if any) and ultimately devise the classification based on each individual Sex/Weight group.