



سائنسوں کے سوسائٹی پاکستان

خلاصے

شعبہ علوم طب و دوا سازی

انیسویں سالانہ کانفرنس

زیر اہتمام  
جامعہ قائد اعظم اسلام آباد

۱۹۷۹ء

عارفہ نعمان اور محمد اویس خان

یونیورسٹی

شعبہ لیبیڈیاٹس ، جامعہ کراچی

مؤثر اجالی ٹگار کے ذریعے بخیرین کے کسی بھی شکر کا بقیہ ایکسٹریکٹ لینے  
ہونے پتہ لگایا جاسکے گا خاہر طور پر ریڈیٹ کی ہڈی کے ٹیڑنا ہونے کی تشہید میں  
بہت معاون ثابت ہوا ہے۔

\*\*\*\*\*

پروسویس گلان ڈولہ کے قلیاسے اور ان کی ضد

جرثومی مطالعہ

عثمان فنی خان ، رفیق الدین احمد ، قاضی نجم الثاقب

کلیہ علم الادویہ ، جامعہ کراچی اور

حسین ابراہیم جمال پوسٹ گریجویٹ آف کیمسٹری ، جامعہ کراچی


پروسویس پیس لوگ ادویہ میں باخبر کڈنیا اور بائج حمل کے طور پر استعمال کے

شراہد ملتے ہیں ، پناہچہ انہیں ادویاتی استعمال کو مد نظر رکھتے ہوئے - پیس -

گلان ڈولوسا کے تحقیق شروع کی ، ان میں تین عدد قلیاسے حاصل کیے گئے ہیں اور ان

کا ضد جرثومی مطالعہ کیا گیا -

MOIRÉ CONTOUR RECORDER\*

SYED ARIF KAMAL<sup>§</sup> 

Department of Physics, Indiana University  
Bloomington, Indiana 47405, U.S.A.

and

MOHAMMAD AYUB KHAN

Department of Applied Physics, University of Karachi  
Karachi-32, Pakistan.

A non-invasive technique for the determination of childhood scoliosis and other bone deformities by obtaining the moiré photographs of the body is discussed. This paper introduces a new lamp and scale arrangement for the proper adjustment of the subject.

The radiological examination of every child for the diagnosis of scoliosis and other bone deformities at an early age is not suggestive because X rays are harmful for human body. There is a need for such a process which is quick, reliable and can be performed without the presence of highly trained medical personnel. Moiré topography offers the possibility of recording precise body contour lines on film which can be analyzed for body deformities. In this technique contour lines of an object are produced as interference fringes while the object is illuminated

---

\*

English translation of the paper (in Urdu) presented during the Scientific Society of Pakistan's 19th Annual Science Conference, Quaid-i-Azam University, Islamabad (Pakistan), September 1979.

<sup>§</sup>Homepage: <https://www.ngds-ku.org/kamal>  
e-mail: [profdrakamal@gmail.com](mailto:profdrakamal@gmail.com)

by a spotlight through a special screen. The fringe pattern is produced by the interference of the screen and its shadow on the object. This method was applied by Adair et al.<sup>1</sup> for childhood scoliosis screening. Takasaki<sup>2,3</sup> suggested the possibility of obtaining contour moiré pictures of full size living body. The method is outlined here to take the moiré photographs of chest, back and other parts of the body for the detection of possible bone deformities by noting the asymmetry of contours. The screen in this case should be (50 x 150) cm so that full length photograph can be obtained.

The following presents a design of the apparatus and an outline of the experimental procedure. This is a modification of the procedure employed by Adair et al.<sup>1</sup> The actual experimental work has yet to be carried out.

#### TECHNICAL DATA

Required floor area	400 cm x 86 cm
Height	180 cm (approx.)
Total weight	60 kg (approx.)
Power requirements	2100 watt (two studio lights) 200 watt (electronic flash)
Screen	50 cm x 150 cm, horizontal lines 1 mm thick, line pitch 2 mm (grating constant)
Horizontal distance between camera lens and screen	1700 mm
Vertical distance between camera lens and light source	600 mm
Two lamps	6 volts
Glass plate with graduations (scale)	50 cm x 50 cm

Plane mirror	20 cm x 20 cm
Cellofene filters (yellow)	
Standard Cardboard Tailor's dummy	

#### PHOTO TECHNICAL INFORMATION

35 mm camera	Yashika
Lens	f = 50 cm
Recommended Aperture	F/8 or F/5.6 (maximum)
Recommended Exposure Time	should not be more than 1/25 sec
Film	TRI-X (ASA 400/27 DIN) (High contrast)
Light Source	2 quartz studio lights

#### EXPERIMENTAL SET UP

A screen is to be constructed using fishing line of nylon, approximately 1 mm thick, stretched horizontally across a rectangular opening in a wooden board. The line is to be dyed matte black to provide satisfactory contrast. The opening should be 50 x 150 cm to obtain contour lines for the whole body. Two 12.7 mm threaded rods with a pitch of 13 threads per inch (25.4 mm) placed along the vertical sides of the opening, may be used to space the lines of equal distances across the opening. The space between the adjacent lines should be approximately 1 cm. An aluminium frame must be attached to strengthen the wood and to prevent distortion by the considerable combined force of the lines. Adjustment screws should be added to the base so that the screen could be set up vertically with the lines horizontal (Fig. 1).

Illumination of the subject is to be provided by two 'Quartz Studio Lights'. These 1000 watt lights should emit a combined energy of about 55000 lumens. To get nearly monochromatic light cellofene (yellow) is used as a filter. The image definition primarily depends on the position of the subject. If the back of the subject is not exactly parallel to the screen, asymmetry will be obtained which may be considered due to bone deformities. Therefore a special lamp and scale arrangement is used to ascertain that the patient's back is parallel to the screen. First a plane mirror is held adjacent to the screen. We decide the place which is to be taken as reference point on the screen and put cross-wires behind the screen. The cross-wires can also be drawn on the mirror for the adjustment and these should coincide with the cross-wires on the slide. A graduated scale is kept above the lamp 1 which is kept at a fixed distance from the mirror on the left side of the screen. Light from the lamp strikes the mirror and is reflected back to the scale. Consider the vertical scale. If the mirror is kept parallel to the screen (which is perpendicular to the floor), the light ray should fall back on the normal scale. If the mirror is slightly rotated about the vertical axis, the ray will not fall on the vertical scale but displaced rightward or leftward. To make sure that the mirror is not tilted about the horizontal axis, the distance between the origin of scale and lamp should be the same as the distance between the origin and the image spot, provided the cross-wire drawn on the mirror is at the same level as the origin of scale. For further adjustment of the horizontal position lamp 2 is placed in line with the horizontal scale and adjustment is done to obtain the image on

the horizontal scale at the same distance from the origin as the lamp 2 is from the origin. When the adjustment is done, fix the screen and scale at their respective positions. Remove the mirror. Ask the patient to stand erect with his back close to the screen, in a relaxed and normal mode, looking straight ahead. The lights in the room in which the instrument is used should not interfere with the photographic process. Subdued light conditions are recommended for best results. Now hold the mirror touching the pelvis of the patient and adjust it in such a way that the reflection from lamp 1 falls on the vertical axis and that from lamp 2 falls on the horizontal axis (at any place). The adjustment is now done and the photograph can be taken. The contour lines can be obtained not only for the back, but also chest and other parts of body.

---

<sup>1</sup>  
I. V. Adair, M. C. van Wijk and G. W. D. Armstrong, Clin. Orthop. 129 (1977)165.

<sup>2</sup>  
H. Takasaki, Appl. Opt. 9(1970)1467.

<sup>3</sup>  
H. Takasaki, Appl. Opt. 12(1973)845.

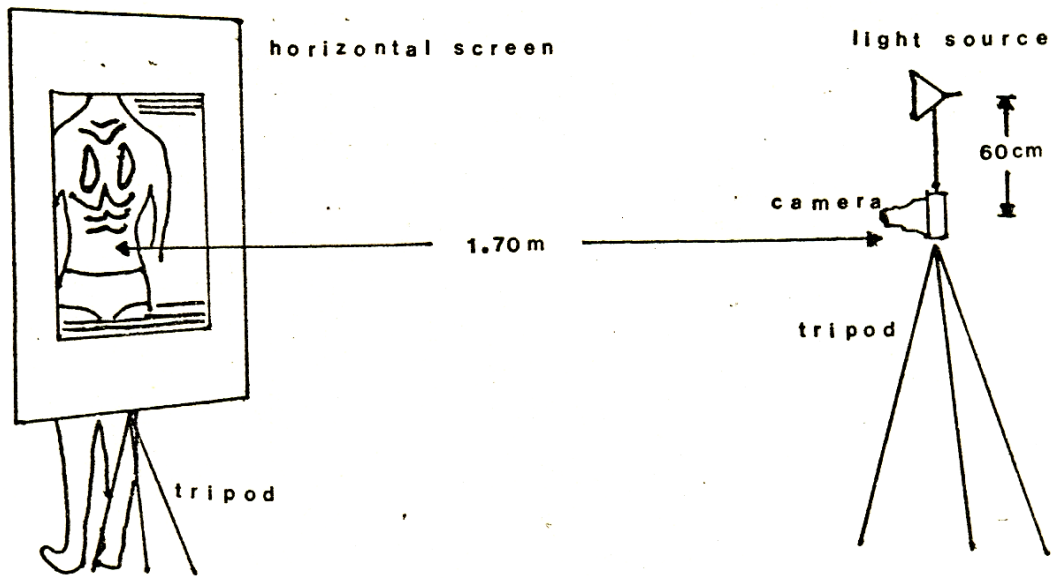


FIGURE 1: Arrangement of Equipment

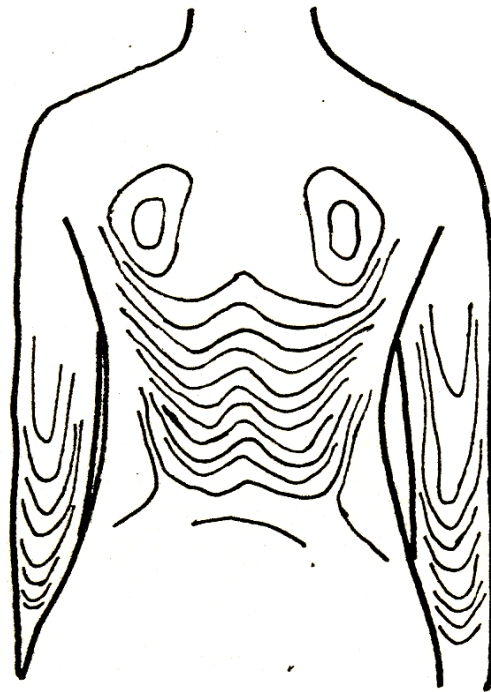


FIGURE 2: Moiré Pattern of a Normal Spine

