

DETERMINE THE PARAMETERS FOR PHOTOELECTRIC EFFECT DATA USING CORRELATION AND SIMPLE LINEAR REGRESSION

(Menentusahkan Parameter untuk Data Kesan Fotoelektrik Menggunakan Kolerasi dan Linear Regressi Mudah)

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ABSTRACT

Pearson's correlation coefficient, otherwise known as the product-moment correlation coefficient, a non-parametric process, is a very important concept in statistics, data science, and even in machine learning. It has gained tremendous acceptance in almost all fields and industries where data analysis is the business of the day. It helps to highlight the affinity between two variables whose behaviour might be entirely different, correlation coefficient is an indicator that shows whether such affinity is positive, negative, or none, when no linear relationship can be established between the variables. It is characterized by a numerical value that ranges between -1 and 1. These values serve as the indicators that determine the status of the relationship. In this research, we utilized the idea of correlation coefficient and simple linear regression on experimental data of photoelectric effects to determine the Planck constant, work function, and threshold frequency using MATLAB code.

Keywords: correlation coefficient; linear- regression; MATLAB code; Planck constant

ABSTRAK

Pekali korelasi Pearson, atau dikenali sebagai pekali korelasi momen produk, proses bukan parametrik, ialah konsep yang sangat penting dalam statistik, sains data dan juga dalam pembelajaran mesin. Ia telah mendapat penerimaan yang luar biasa dalam hampir semua bidang dan industri yang mana analisis data adalah perniagaan pada hari ini. Ia membantu untuk menyerlahkan pertalian antara dua pembolehubah yang tingkah lakunya mungkin berbeza sama sekali, pekali korelasi ialah penunjuk yang menunjukkan sama ada pertalian tersebut adalah positif, negatif atau tiada, apabila tiada perhubungan linear boleh diwujudkan antara pembolehubah. Ia dicirikan oleh nilai berangka yang berjulat antara -1 dan 1. Nilai ini berfungsi sebagai penunjuk yang menentukan status perhubungan. Dalam kertas kerja ini, kami menggunakan idea pekali korelasi dan regresi linear mudah pada data eksperimen kesan fotoelektrik untuk menentukan pemalar Planck, fungsi kerja, dan kekerapan ambang menggunakan kod MATLAB.

Kata kunci: pekali korelasi; regresi linear; kod MATLAB; pemalar Planck

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