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Data Article

Initial data release of regular blood drip stain created by varying fall height, angle of impact and source dimension



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ABSTRACT

The dataset developed consists of 108 blood drip stains developed with fresh porcine blood, blood admixed with different dosage of Warfarin and Heparin, respectively. For each particular blood type (i.e. fresh blood, blood admixed with Warfarin at different dosage and blood admixed with Heparin at varied dosage) stain patterns were created by passive dripping of blood from a 2.5 cm³ subcutaneous syringe with needle filled to capacity, at 30°, 60° and 90° angle of impact with corresponding fall height of 20, 40 and 60 cm respectively. In the other dataset of 162 datapoints, 81 regular drip stains were formed from blood that had dripped passively from a subcutaneous syringe without needle at the aforementioned angle of impact and fall height, while the other stains were formed as a result of dripping of blood from a subcutaneous syringe with needle. In order to compare stains formed, all stains were recorded on the same representative, non-porous, smooth target surface under similar physical conditions. The interpretations relevant to the dataset are available in the article titled '2D Source Area prediction based on physical characteristics of a regular, passive blood drip stain' (Basu and Bandyopadhyay, 2016) [7]. An image pre-processing algorithm for extracting ROI has also been incorporated in this article.

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Specifications Table

Subject area	<i>Statistics, Computer Science</i>
More specific subject area	<i>Machine Learning</i>
Type of data	<i>Figure, table</i>
How data was acquired	<i>Data was acquired with Camera, Nikon COOLPIX L610</i>
Data format	<i>Raw data</i>
Experimental factors	<i>Atmospheric Conditions [Dry Temperature: 23 °C, Wet Temperature: 26 °C, Relative Humidity-77–78%, Wind Condition: Not Windy], Blood Temperature: 37 °C. Experimental Room[Temperature: 37 °C, Humidity: 60%, Wind Condition: Not Windy]</i>
Experimental features	<i>The experiment was undertaken at the Kolkata Municipal Slaughter House. Pig blood was allowed to drip from a subcutaneous syringe filled to capacity (2.5 cc) under the action of gravity. Blood was allowed to drip from a height of 20, 40 and 60 cm at 30°, 60° and 90° respectively. All stains were taken on 75 GSM white paper and allowed to dry before photography.</i>
Data source location	<i>Kolkata Pig Slaughter House, Tangra, Kolkata, West Bengal, India Latitude: 22.5577172; Longitude: 88.3866585999992</i>
Data accessibility	<i>Data described is within this article and is available at Figshare https://figshare.com/s/4207047f45a4add5fd76</i>

Value of the data

- The dataset is the first of its kind.
- No dataset for bloodstain patterns is available as a benchmark dataset for computer scientists or mathematicians who do not have access to resources to create such a database.
- The dataset can be processed in a standard computer with 4 GB RAM.
- The dataset has been developed as per the physical evidence documentation guidelines followed in Forensic science.

1. Data

Passive drip stains were developed from blood droplets of fresh porcine blood, blood thoroughly admixed with different dosage of Warfarin (i.e. 2 mg, 4 mg, 6 mg, 8 mg, 10 mg) and Heparin (i.e. 260 I.U., 520 I.U., 780 I.U., 1040 I.U., 1300 I.U.) emanated from a subcutaneous syringe with and without needle by varying the angle of impact in the range of 30°, 60° and 90° against fall height of 20, 40 and 60 cm [1,2] respectively. The drip stains were photographed based on the guidelines followed for documentation of physical evidence in forensic science. Table 1 documents the standards used for archiving the drip stain pattern images.

2. Experimental design, materials and methods

Pig blood was used in developing the bloodstain dataset as pig blood rheology closely resembles human blood rheology [3,4]. The experiment was undertaken at the Kolkata Municipal Pig Slaughter House with due permission from the concerned authorities.

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