

## THE DESIGN OF CONTEMPORARY BATIK INSPIRED BY JAWI WRITING: A MATHEMATICAL PERSPECTIVE

Wan Norliza Wan Bakar<sup>1\*</sup>, Junaidi Awang<sup>2</sup>, Nani Hartina Ahmad<sup>3</sup>,  
Mohd Saipuddin Mohd Hasbullah<sup>4</sup>, Mohd Zafian Mohd Zawawi<sup>5</sup>

<sup>1</sup> Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Machang, 18500, Malaysia;

<sup>2,3,4</sup> Faculty of Art and Design, Universiti Teknologi MARA, Machang, 18500 Malaysia;

<sup>5</sup> Faculty of Information Management, Universiti Teknologi MARA, Machang, 18500 Malaysia;

\* Corresponding author. Email: wliza349@uitm.edu.my

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**Abstract:** *Jawi Writing is a writing system that uses the Arabic alphabet to write the Malay language. Jawi Writing is not only a symbol of appreciation for Islam but is also used as a motif in batik design. The purpose of this study was to analyze the design of contemporary batik inspired by Jawi's writing through the lens of mathematics. This is a qualitative study by employs the triangulation method to collect data consisting of observation, analysis, and interview. The samples used in this study were Jawi-inspired contemporary batik designs created by Mr. Junaidi Awang, a senior lecturer from the Faculty of Art and Design, UiTM Kelantan. The results of this study indicated that the Jawi letters of  $\text{و}$  and  $\text{ش}$  are arranged in three symmetrical axes of  $x$ ,  $y$ , and  $z$  and are formed in translation and reflection. In addition, more studies on other Jawi letters and other ways of arranging the Jawi letters can be conducted.*

**Keywords:** *Contemporary Batik Design, Ethnomathematics, Jawi Writing*

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### Introduction

Batik comes from Javanese words 'amba' which implies composing and 'nitik' means nitik spot. Batik is an artistic idea of drawing on fabric by using wax. Once the drawing on fabric is completed, there is a coloring process using a few ranges of colour to create a variety of motifs and designs according to the tastes of the batik artists. There are several types of batik, namely hand-drawn batik, screen-printed batik, tie-dye batik, and block-printed batik. Batik has two different designs, geometric and organic motifs. The geometric motifs are Bamboo Shoot Motif and Mixed Box Motif. The organic motifs are Bamboo Flower Motif, Orchid Flower Motif, Butterfly Motif and Snail Motif (Puspita Ayu Permatasari, 2019).

Batik artwork has its own uniqueness and heritage that must be preserved. Previously, the common designs in batik are the motifs of flora, fauna and abstract. Nowadays batik designers are moving towards a new era, and they are called as contemporary batik designers, which is

modern in design and referred to the trend of the 20<sup>th</sup> century or in the 21<sup>st</sup> century. Contemporary batik designs are ways in which the designers present current issues, styles and ideas. Designers are no longer limit themselves to simple metal block stamping patterns, silkscreen, stenciling, rollers and spray guns but switch to all viable options to apply designs (Poon, 2017).

Batik design in Malaysia is contemporary and versatile. The designers do not stick to their ideas on flora, fauna and abstract motives only but move forward to new ideas such as calligraphic art or Jawi writing which is a writing system that uses the Arabic alphabet to write the Malay language., This is a new dimension where the designers show the sign of their faithfulness to Allah and show the Islamic identity and the culture of Malaysia.

### **Literature Review**

Jawi writing is the usage of the Arabic alphabet to write the Malay language. It is an alternative writing system in Malaysia. The risen of Jawi writing started in 1300 AD in the Malay Archipelago. At that time, Jawi writing was known as a form of Arabic literature introduced by the Persians to the Malays. The earliest evidence of Jawi writing in Malaysia is found on Batu Bersurat Terengganu dated 1301 AD that contains several Jawi words in alphabetical order from alif, ba, ta to ya. Jawi writing has a limited implementation that is only for a specific function of ritual and cultural events. Jawi is used as an occasional system of writing among the Malay community in the Philippines, Thailand, Malaysia, and certain areas in Indonesia. Jawi writing is also used as motifs in batik design.

The implementation of Jawi writing on Indonesian batik design is very widespread. The Bangkahulu people use Jawi writing for motifs in batik, known as Batik Besurek. The term “Besurek” alludes to material that contains letters engravings. Besurek Batik craftsmanship in Bengkulu was presented by batik dealer and craftsman from Damak, the biggest Islamic kingdom in Java Island (1475-1548). The design uncovers the hall owned of Kaganga letters or Bengkulu unique letters combined with Jawi writing. Batik Besurek too, employs the magnificence of *Rafflesia Arnoldii*, as uncommon blossom species in Bengkulu area as a theme (Dervish, 2016).

In Semarang, contemporary batik with Jawi writing is widely produced. They are Batik Hijaiyyah Ceplok Tunggal, Batik Sinuwun Manggar Asem and Batik Sekar Tinadhah Asem (Prayitno, 2016). Batik Hijaiyyah Ceplok Tunggal is a motif that exploits the form of Arabic letters maintaining their original form. Due to Sushwahyuni, the design of Batik Hijaiyyah is deliberately done so that the people understand the difference between Arabic letters and other letters. These letters are combined with the classic motifs of ‘Ceplok’ to show a high level of cultural adaptation. Batik Sinuwun Manggar Asem use the basic letters of Hijaiyyah which is combined with coconut, corn and flower motifs. It is based on the rich flora and cultivation of the local community.

Batik Sekar Tinadhah Asem is in the form of Arabic letter base which is combined with various flowers and saplings. In Malaysia the earliest evidence of jawi writing was found on Batu Bersurat Terengganu dated 1301 AD. After a few recent decades, then, there is an awareness on preserving the Islamic and cultural identity of the community by handling the Terengganu International Islamic Art Festival 2013, featuring a unique art of batik khat that combines the tradition of Terengganu Batik and jawi writing. The combination of batik and jawi writing is an innovation in Malaysia which represent the local identity of the state that produced batik. This good effort in featuring the combination of batik design and jawi writing

should be extended to other states in Malaysia that produced batik such as Kelantan and Sarawak.

It is a very necessary effort among the batik designers to design jawi writing and local batik identity to preserve this valuable treasure of Malaysia and make the world acknowledge Malaysia differently. The younger generation then, will always remember the national identity of Malaysia. Mathematics has a close connection to arts, for example, the perspective theory is more prominent than the measurement. Mathematics consists of numbers, algebra and geometry. Geometry is a type of mathematics concerning size, shapes, positional figures and properties of space. The implementation in geometry can be seen in architecture, art and engineering (Ulum, 2018).

The usage of geometry in architecture is in the concept of symmetry, tessellation and similar objects. The concept of symmetry can be seen in congruence and movements. Few concepts can be extracted from symmetry for example reflection and translation. The meaning of reflection is flipping to itself (Popov, 2001). The concept of translation is that every point is moving in the same direction and distance. The initial object is the pre-image and the other is the image (Whittaker, 1988). Tessellation is the covering of a plane, utilizing one or more geometry shapes called tiles with no covers or holes.

Jawi writing on batik design can be analyzed through ethnomathematics which uses mathematical concepts to study cultures in the community. It is research that studied on the implementation of a group of people's ideas on design. These ideas can be identified as mathematical practices. Ethnomathematics is perceived as a lens to see and understand mathematics as a culture (Mika Ambarawati, 2019). Ethnomathematics presents the mathematical concept in the arrangement of Jawi writing for a better understanding of the culture.

There are few researchers of ethnomathematics that study batik design. A study was done by Rully (Prahmana, 2020) which explores the mathematical concept in Yogyakarta batik pattern. This study indicates that Yogyakarta Batik uses the concept of geometry transformation in making batik. The motif pattern contains the local values and philosophical values. (Ari Irawan, 2019) studied ethnomathematics batik design in Bali Island. The study reveals that in typical Balinese Batik there are several elements in the transformation of mathematics that are transaction, reflection and rotation. There are dilation elements such as spiritual and distinctiveness of Balinese society.

There is the influence of culture of palace and religion of Islam, Hindu and Buddhism. (Naufal Ishartono, 2021) studied the mathematical concept in Batik Sidoluhur Solo and found that the geometrical transformations are translation and reflection and the plane geometry transformations are translation and reflection and plane geometry involved such as rhombus, rectangle, triangle, circles and congruences. (Mika Ambarawati, 2019) studied Malang Batik Design and found that the mathematical concepts involved are two-dimensional figures. (Wan Norliza Wan Bakar, 2021) studied contemporary batik design using alternative resistance like iron brush, copper cake mold, paper box, wooden broom and found that different forms of shapes produced such as circle, half-square shape and hexagon. Legino(2015) studied symmetrical motif design on Malaysian Batik Sarong pattern. She found that the symmetrical placement is translation, rotation and reflection.

Few researchers explore new dimensions of batik designs. (Norzieha Mustapha, 2019) proposed new designs called as Koch snowflake batik design which is commonly known as a type of fractals by using magnification process. The geometrical motifs are vertical stripes, horizontal stripes and circles that were arranged in tessellation.

This paper explores several contemporary batik designs inspired by Jawi writing innovated by Mr. Junaidi Awang, of UiTM Kelantan. These creative and unique designs could be appreciated and analyzed through the lens of ethnomathematics, who studied the culture of the community.

### Methodology

As the research objective is to explore the contemporary batik design inspired by Jawi writing from a mathematical perspective, a qualitative method was employed. The sole respondent in the study was Mr. Junaidi Awang, a senior lecturer in the Faculty of Art and Design majoring in Textile Design, who has won many awards for his innovation in textile design. Mr. Junaidi Awang was assisted by a team of two lecturers in the Faculty of Art and Design.

To achieve the research objective, triangulation consisting of observation, analysis, and interview was employed to collect primary data. An observation of geometrical design covering the size, arrangement, frequency patterns, and symmetrical lines of Jawi writing through photos and products was conducted. The input obtained was then analyzed to acquire the geometrical concept of Jawi writing. An interview with Mr. Junaidi Awang who designed the *ش و ي* motifs was conducted. Meanwhile, secondary data was collected from books, magazines, and websites.

### Analysis

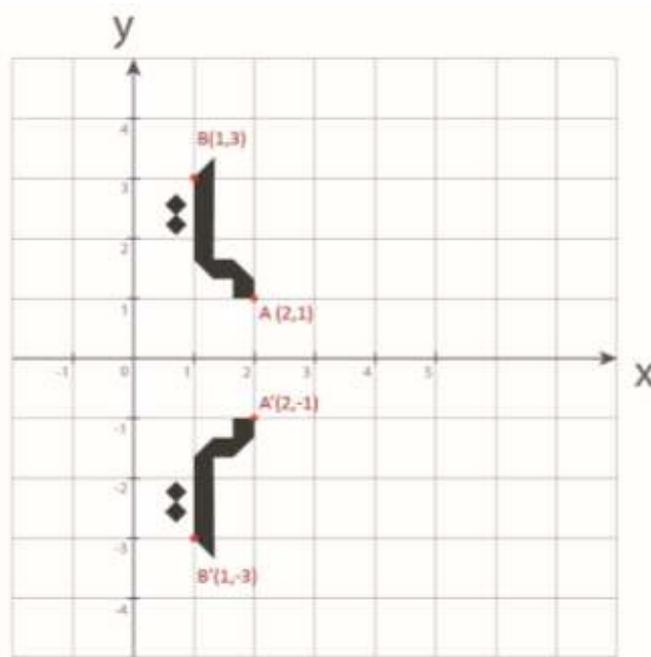
There are 28 letters in Jawi writing such as below:

ا ب ت ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ء

In this paper, we decided to select only three letters, *ش و ي*. This is because these three letters can be easily analyzed from a mathematical perspective.

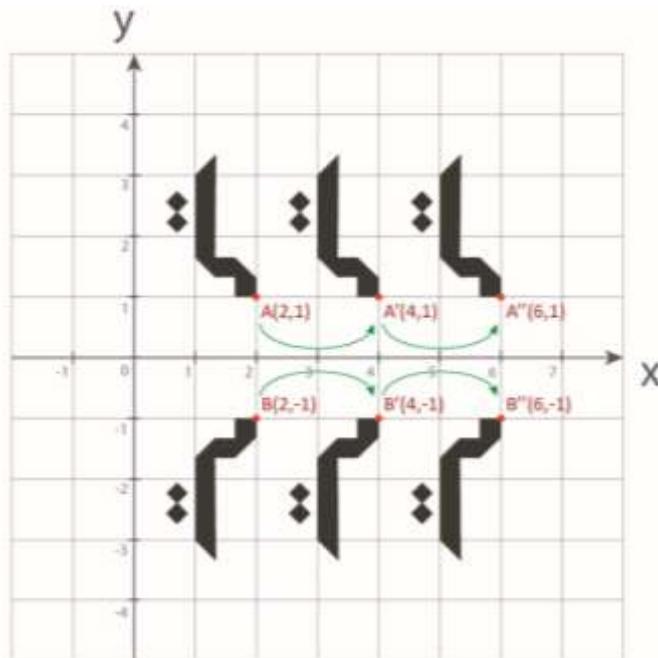
#### i) *ي* motif

*ي* is the last letter in Jawi writing. In this design, Mr. Junaidi Awang and his team chose Kufi Calligraphy. He started with a single *ي* motif, and the scrutiny of the design showed that there exists a reflection across x-axis from A (1,1) to A' (1, -1). The same process goes to B ( $\frac{1}{2}, 4$ ) to B' ( $\frac{1}{2}, -4$ ). This can be seen in Figure 1 below.

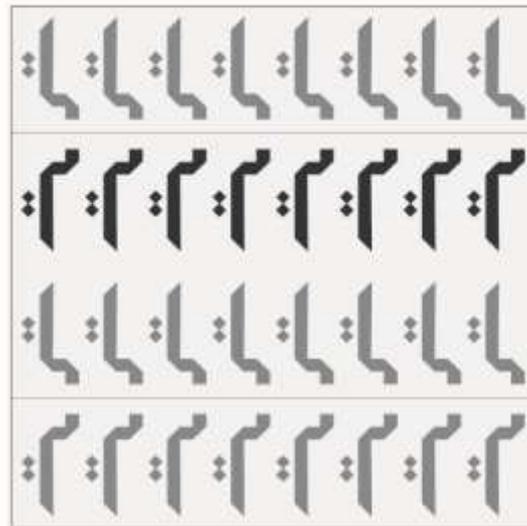


**Figure 1: The Reflection of  $\zeta$  motif across x-axis.**

The next step is the process of translation. Which means every point in a figure  $\zeta$  in the same. The translation has similarity in distance and direction.



**Figure 2: The Translation of  $\zeta$  Motif Vector**

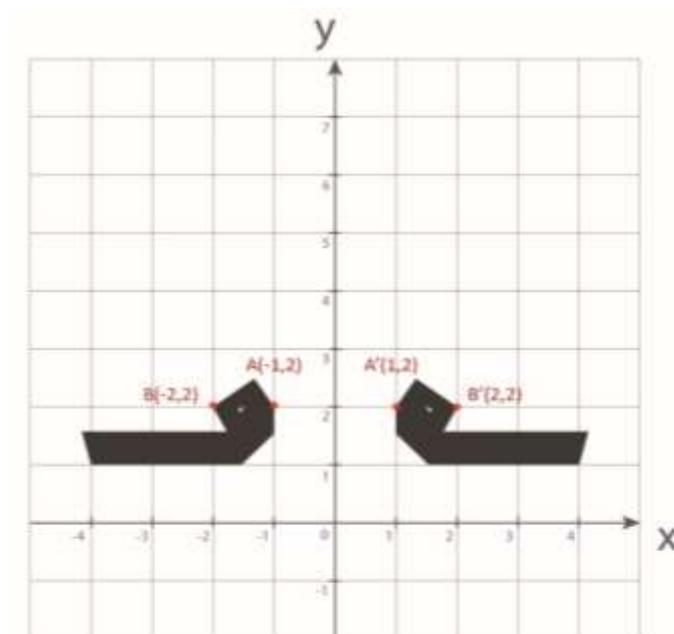


**Figure 3: The Arrangement of س Motif in x-axis**

Figure 3 shows the overall arrangement of س motif on x-axis.

ii) و motif

و is the twenty-eighth letter in Jawi writing. Again, Mr. Junaidi started with a single و motif and a close look that there is a reflection of و motif across y-axis. From A (1,1) to B (2,1). The same process goes to each corner. This is illustrated by Figure 4.



**Figure 4: The Reflection of و Motif across Y-axis.**

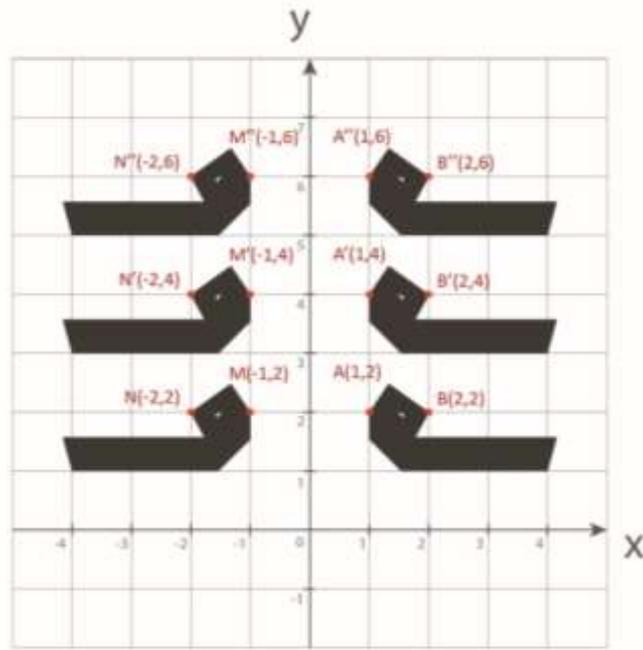


Figure 5: The Translation of 9 motif in Vector  $y = 1$

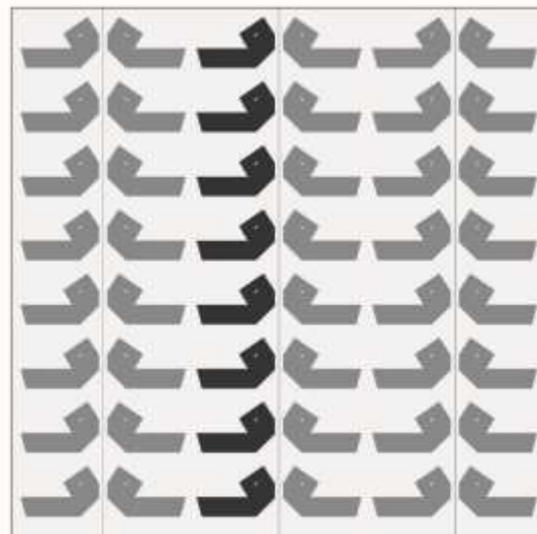


Figure 6: The Arrangement of 9 Motif in y-axis

Figure 6 shows the overall arrangement of 9 motif after the process of reflection and translation.

iii) ش motif

ش is the thirteenth letter in Jawi writing. Mr. Junaidi began with a single ش motif. The scrutiny looks at the design showed that there is a reflection of ش motif across that  $y = x$  axis. A (3,3) goes to B (4,4) and the process repeats to each corner. This is depicted by Figure 7.

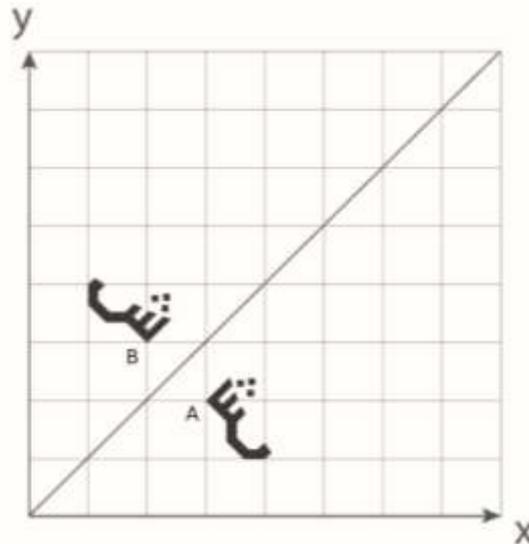


Figure 7: The Reflection of ش Motif Across  $y = x$  axis.

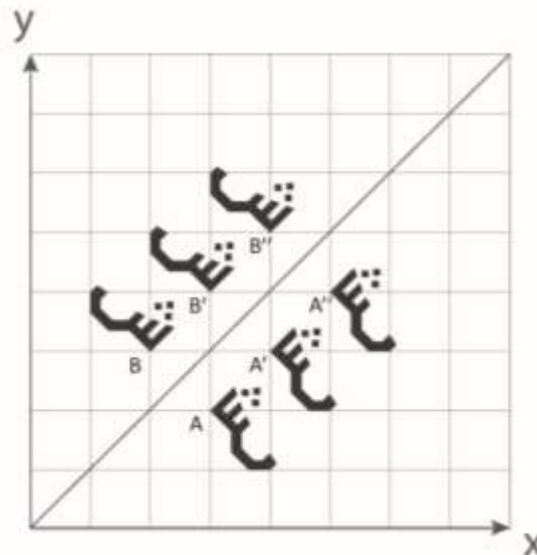


Figure 8: The Translation of ش Motif



**Figure 9: The Arrangement of ش Motif in  $y = x$  axis.**

Figure 9 shows the overall arrangement of ش motif after the process of reflection and translation.

An interview which was held with Mr. Junaidi showed that the philosophy in the design of three motifs ش و ي showed the appreciation of Allah and the beauty of Islamic words. This beauty, thus, will make those who wear it to always remember the greatness of Allah. The design of these words on contemporary of batik design is a continuity of the kufi calligraphy art which was developed by the Muslim artist.

### **Conclusion**

Jawi writings can be illustrated as a motif on batik design. Three Jawi letters were arranged in two symmetrical axes of  $x$ ,  $y$  and were formed in translation and reflection. In future more jawi letter with different arrangement can be used as motifs in contemporary batik design. The design of contemporary batik inspired by Jawi writings is an innovation which can be introduced locally and internationally. It is a new dimension to today's fashion. This design is a new paradigm that will upgrade Malay heritage. The design in contemporary batik inspired by Jawi writings will attract the attention of batik lovers in Malaysia and international countries. It is hope that design will be chosen and receive great appreciation by them.

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