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Utilizing Biomimicry Trends as a Creative Approach for 3D Textile Printing Design

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Abstract:

Design depends on creativity and innovation in addition to represent possible solutions to design problems to reach the best functional and aesthetic design ideas. However, thinking about design according to the standards and foundations of sciences concerned with studying nature which opens new directions for the textile printing designer and new windows of creativity and innovation based on science to meet all functional and psychological requirements of man.

Therefore, modern design trends have emerged based on the study of nature. The science of nature helps the designer to understand the relationships and organizations between natural forms .So we can able to deduce design solutions by applying the standards of these sciences, including biomimicry science, which is a trend that supports advanced technology for the field of textile 3D printing .

The problem is how to include the natural sciences, specifically the Biomimetic trend, in the design of 3D textile printing.

Significance: 1- Studying the foundations of the biomimicry trend to add another dimension of creativity and innovation to textile printing design. 2- Identifying 3D textile printing as one of the modern methods of printing.

Research objectives: - To review one of the modern trends in design and link it to the field of textile printing design.

Extracting the concepts of biomicrology to use and link it to the field of 3D textile printing design.

- Studying 3D printing as an advanced technology to add a new form to textile printing design.

Results: 1- Modern theories create a new window to textile printing design.

2-Linking scientific theories and related scientific knowledge skills to achieve upgrading skills of the textile printing designer. 3- The use of biometric design as one of the trends that the textile printing designer should pay attention to study from a scientific perspective to achieve design solutions and compatible with nature.

4- 3D printing is a rapidly developing technology that a textile printing designer must study to create a design suitable for implementation with this technology.

Recommendations: 1- Encouraging designers and students of textile printing design to study the Biomimetic trend as a direction that can be used in the design of three-dimensional textile printing.

2- The importance of inspiring the biology of living organisms and microorganisms in nature, which opens a new field for understanding aesthetic structural systems and achieving sustainability in nature.

3- The necessity of benefiting from modern natural sciences and placing them in the list of basic sciences closely related to design. 4- The necessity of communicating between the results of scientific research and its modern techniques and its rapid development with art and design to open applied plastic approaches with a distinct aesthetic practice in the field of textile printing design. 5- The need to follow the technical and scientific development of printing in its various forms, especially 3D printing, with the need to study it as a scientific method specialized in both its technological and design aspects.

Keywords:

Biomimetic – Creation – 3D Printing

References:

1- Doaa Ismail Ismail Attia (2015) : Using Biomimicry in Eco-interior Design ,International Design Journal , Volume 5, Issue 2.

1. Doaa Mohamed Abbas Mandor(2019) : Biomimicry as a means of Innovation and Sustainability in the Field of Product Design, Architecture and Arts Magazine, Volume 18 .
2. Dinaa Mohamed Abbas Mandor(2011) : The effectiveness and efficiency of design in harmony between how nature works and the way of human thinking as a field for visual training, formation, building and refining the basic skills of design, Conference on the Development of Quality Higher Education Programs in Egypt and the Arab World (6th Arab - 3rd International).
3. Benyus J.M.,(2002): Biomimicry;Innovations inspired by Nature, Harper Collins publishers, Perennial press.

4. Lepora,NathanF;et.al,(2013):"The State of The Art in Biomimetics",Bioinspir.Biomim.,Vol.8,013001,11pp.doi:10.1088/1748-3182/8/1/01301.
5. Lopes LR, Silva AF, Carneiro OS.(2018): Multi-material 3D printing: the relevance of
6. materials affinity on the boundary interface performance. Addit Manuf.
7. Pedrsen Zari,MTG.(2007): Biomimetic Approaches to Architectural Design for Increased Sustainability. Presented in : The SB07 NZ Sustainable Building Conference. Auckland.
8. Samit Chakraborty , Manik Chandra Biswas(2020) : 3D printing technology of polymer-fiber composites in textile and fashion industry: A potential roadmap of concept to consumer, Composite Structures, Textile Technology Management, Department of Textile and Apparel, Technology and Management,.Department of Textile Engineering, Chemistry and Science, Wilson College of Textiles, North Carolina State University, USA, 2020.
9. Taylor A, Unver E. (2014): 3D Printing-Media Hype or Manufacturing Reality: Textiles Surface Fashion Product Architecture.
10. Kim Y-S, Lee J-A, Kim J-H, Jun Y-S.(2015): Formative characteristics of 3D printing
11. fashion from the perspective of mechanic aesthetic. Res J Costume Culture . http://publication.du.edu.eg/jsystem/index.php/app/article/view/2345 - Journal of Applied Arts & Science - 20/10/2020 .
12. https://www.treehugger.com/how-golden-ratio-manifests-nature-4869736 - Treehugger Sustainability for All - 20/5/2021.
13. https://www.123rf.com/photo_57440423_stock-illustration-illustration-of-spiral-arrangement-in-nature-fibonacci-pattern.html
14. https://joedubs.com/flower-power
15. https://www.centreofexcellence.com/shop/fibonacci-numbers-golden-ratio-diploma-course/15-
16. https://www.andarastars.com/sacred-geometry-the-root-of-all-languages-in-the-universe/16-
17. https://www.art.com/products/p48208491971-sa-i10829939/gabriel-scott-this-is-a-close-up-shot-of-fresh-artichokes-in-rome-s-market-at-campo-dei-fiori.htm?RFID=990319
18. http://www.digitalgallery.co.za/heinrichvdb/art-of-nature.php - Digital Gallery #/ 18-
19. https://www.flickr.com/photos/heatherbelle/6748800561/in/photostream - flickr - 1/6/2021
20. https://www.pinterest.com/pin/458241330839029821/20-
21. https://www.pinterest.com/pin/200902833363717785 - Pinterest - 1/5/2021 . /21-
22. https://500px.com/photo/117873927/honeycomb-by-Laurentiu-Iordache - 500px / 22-
23. https://www.livemaster.ru/topic/103602-vdohnovlyaemsya-prirodoj-mnozhestvo-interesnyh-tekstur-i-faktur 23- Rpmapka Mactepob
24. https://www.flickr.com/photos/lara_hughes/4361334527/ 24-
25. https://www.pinterest.com/pin/138978338476050613
26. https://www.allposters.com/-sp/Bone-Tissue-Posters_i8649710_.htm?AID=1025109454
27. https://www.stocksy.com/62211/mushroom-texture-background
28. https://www.flickr.com/photos/thegreenalbum/7187044526/28-
29. https://www.pinterest.com/pin/17944098486988299/29-
30. https://www.pinterest.com/pin/76842737366255359/30-
31. https://www.pinterest.com/pin/5770305760869859/31-
32. https://morningchores.com/growing-oyster-mushrooms/32-
33. https://www.pinterest.com/pin/8162843044745725/33-
34. https://www.thephotoargus.com/weird-and-wonderful-fungi-pictures/ 34-
35. https://3dprintingcenter.net/interview-with-francis-bitonti-one-of-the-first-designers-to-adapt-3d-printing-technology – 3DPrinting – 30/5/2021.
36. https://www.dezeen.com/2013/03/07/3d-printed-dress-dita-von-teese-michael-schmidt-francis-bitonti/
37. https://all3dp.com/2/3d-printed-fashion-the-state-of-the-art-in-2019/
38. http://1072128843.blogspot.com/2011/11/iris-van-herpen.html - 5/6/2021
39. https://link.springer.com/article/10.1186/s40691-018-0162-0 - Springer Link - 20/5/2021 - 39-
40. Sohyun Kim , Hyunjin Seong , Yusun Her and Jaehoon Chun : A study of the development and improvement of fashion products using a FDM type 3D printer Sohyun , 2019 .
41. https://www.digits2widgets.com/3d-printed-fabrics-in-nylon-sls-now-for-sale40-
42. DIGITS2WIDGETS - 25/4/2021.
43. http://fab.cba.mit.edu/classes/863.15/section.CBA/people/Jest/week04.html
- 3D PRINTS [Chainmail] - Joshuah Jest
44. https://all3dp.com/2/3d-printed-fashion-the-state-of-the-art-in-2019/42-29/5/2021

https://www.pinterest.com/pin/194077065173509392/43-
45. https://fashioningtech.com/2010/07/22/iris-van-herpen-3d-printed-haute-couture44-
i. https://scarletchamberlin.com/2014/05/14/full-mooned-3d-printed-fashion/45-
46. https://www.sculpteo.com/blog/2016/01/06/virus-collection-line-3d-printed-clothes/#46-
47. https://design-milk.com/3d-printed-top-inspired-electrolysis-water/47-
48. https://www.core77.com/projects/66803/Beeing-Human%e2%80%94A-3D-Printed-Clothing-Collection-Inspired-by-Honeycombs
49. https://www.dailymail.co.uk/femail/article-3179722/Designer-creates-sci-fi-clothing-collection-3D-printing-dresses-coats-shoes-home.html
50. https://design-milk.com/3d-printed-dress-inspired-petals-feathers-scales/50-
51. https://www.sculpteo.com/en/applications/textile-industry

