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Fusion: Computer Science and Dance

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Abstract: ***Dance may not seem like it has much to do with computing but there are some clear links between dance and computing. Basically, a dance is just a series to follow. To dance we have to follow the steps exactly in a defined and repeated order. The same loop we need to execute again and again. This same concept we implement in algorithms. Step by step formation of instructions leads to an algorithm in the programming languages of computer science. A dance is just an algorithm executed by people that is enjoyable to watch. Writing a program and choreographing a dance is very similar to each other. Dance and computing could be a great fusion in coming future for the one who is technical by profession and dancer by passion or vice versa. The primary objective of this study is to understand relation between dance and computing, understanding its practical implementation and obstacles if any.***

Keywords: Dance and computing, choreography with algorithms, coding, dancing, fusion of dance and computer science.

I. INTRODUCTION

Along with the progress of society and the huge development in the field of science & technology, computing technologies have been widely used to the life of people, in the development of modern technologies of teaching and practices. Quality education is in demand nowadays and teaching of dance is also being taken seriously now. Fusion of dance and computing put forward a new challenge, make originally relatively interactive teaching between teacher and students in this technical era of computer science.



Figure 1 : Dance & Computing

Dancers build step by step sequences into whole choreography. Dance can be a fun way to both; understand what an algorithm is and to explore different algorithms. A dance can be choreographed based on an actual algorithm that demonstrated the beauty of algorithm. Not only dance, whole show can also be linked to computing in any program including : the dance , the music, the costumes and the lights.

II. LITERATURE REVIEW

In recent years, the economy has shown an over increasing demand for technical learning and teaching instead of routine curriculum being followed and taught. Organizations are also seeking creative and innovative employees who can have a future vision and technical skills with new design and computational thinking for their employers. The process of integrating art and science, basic skills and technical skills encourages learners to demonstrate adaptive critical thinking and ability to develop flexible problem-solving models. This approach encourages open-minded creative thinking and serves as a form of creative logics and outputs. Computational thinking is an problem solving approach that is based on fundamentals of computing and this approach is modifying the way we think about many fields and disciplines.

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According to National Center of Science and Engineering Statistics (NCSES, 2019), of bachelor's degrees awarded in computer Science in 2016, only 18.7% were awarded to women and 21.6% were awarded to underrepresented minorities. One survey found that women are less interested in such kind of traditional approach but integrating computing and dance can give them and all a new exposure for next level interesting, innovative, critical and computational thinking & programming.

III. COMPUTING-DANCE TEACHING

Multimedia and computer science technology generally refers to the technology of integrated processing of images, text, audio, video and animation through internet and WWW. Data used will form an information system through computing and step by step formation of algorithm in the form of rhythm and tunes. Compared with the traditional form of teaching, this formation will take advantage of realistic technology. It will also collaborate with spatial and visual characteristics which will make teaching learning concept more interesting.

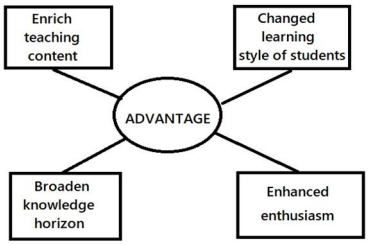


Figure 2 : Computing-dance teaching advantage

Referring to the information of media diversity in form, it can be broadly explained and understood by humans through their sense organs and can form a variety of information.

IV. STEP BY STEP COMPUTATIONAL DANCE FUSION

1) Sorting algorithms
2) Efficiency of algorithms
3) Computational thinking
4) Programming in algorithms
5) Implementation of algorithm

A. Sorting Algorithms

A sorting algorithm takes an array of data and arranges it into a specified order either ascending or descending order. It often used as a way of making things easier to find. During sorting, we compare entries at a given position and swap them based on the conditions provided using loops.

B. Efficiency of Algorithm

An algorithm is considered to be efficient if its resource consumption is at or below some acceptable level. Space and time complexities define the efficiency of an algorithm. That means it should run in a reasonable amount of time and space on an available computer, as a function of the size of input.

C. Computational Thinking

Computational thinking processes to develop code and program applications. This approach automates the problem solving process by creating a series of systematic, logic steps that intake a defined set of input and produces a defined set of output.
Computational thinking involves: -

1) Algorithm thinking
2) Logical thinking
3) Generalization
4) Abstraction
5) Decomposition
6) Evaluation

D. Programming in Algorithms

A programming algorithm is a procedure or formula used for solving a problem. Step by step formation of solution for a particular problem is treated a programming. It is based on conducting a sequence of specified actions in which these actions describe how to do something and will do it exactly the way every time. Algorithm works by following a procedure, made of the inputs or sequence of statements. Programming in dance will be done by converting choreography steps in the form of any sorting algorithm. Basically, in dance we need to take steps forward, backward and round. This sequence of movement can be recorded in count form for eg. 2 steps forward, 2 steps backward, 1 step round and then again come back to the same sequence. Repetition of moves can be put in loops and end will be based on the completion or break of loop. Most commonly used sorting algorithm for fusion of dance and coding used is the bubble sort. This sort is the simplest sorting algorithm that works by repeatedly swapping the adjacent elements if they are in the wrong order.

E. Implementation of Algorithm

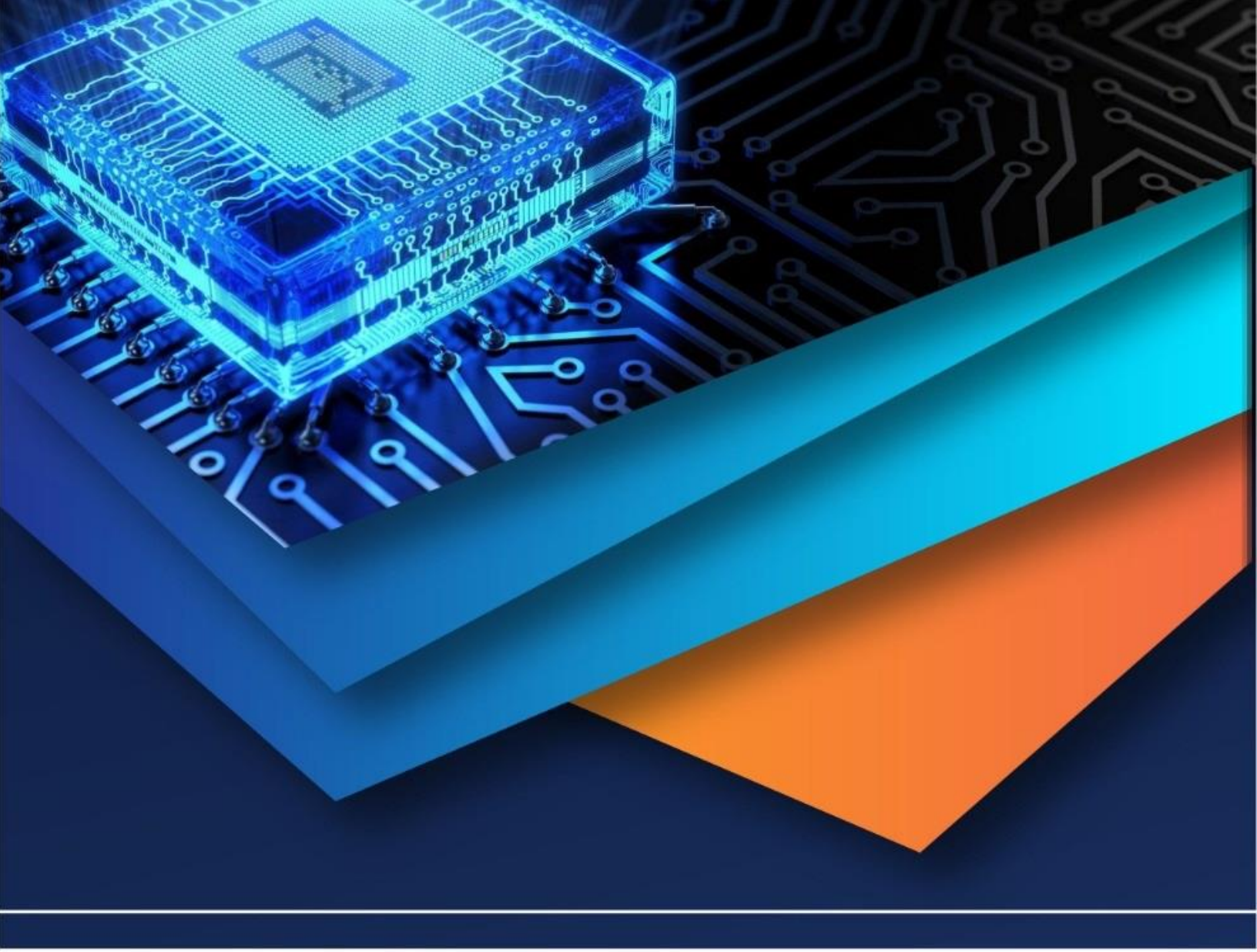
Implementation phase defines the layout problems that should be solved by that particular algorithm in several ways. It defines the structure of the working process, nodes that exist, how are they connected and so on.

V. CONCLUSION

Fusion form of education is growing rapidly in today's field of technology and giving opportunities to both teachers and learners think out of the box and do something new which is innovative, conceptual, cognitive and worth technical without cutting off from the roots of traditional forms. It helps in enriching teaching content, change the learning style of students, enhance the enthusiasm of both tutors and learners towards study and experiment; it will also broaden the knowledge horizon and establish a sense of dance and computing awareness. Combining technology is not an end in itself, but it's a means to improve the quality of dance and computation teaching to the learners. The physical aspects of this training can never be replaced technologies and its possibilities but we can try up to an extend to fulfill that requirements through technology. However, technology is an important tool to promote creative thinking and active participation in teaching and learning. In future, education and teaching fields should actively integrate technical aspects with the traditional form of teaching, should be given huge play to the teacher's leading role in the classroom. More attention should be paid to the subjectivity of the learners in the classroom and allow technologies to maximize its extend and realize teaching methods in the constant innovation of means. Being educators, we should accept the challenges bring to the classroom and integrate teaching methods with technology for cultivating better learners and performers.

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