

Mathematically Generated Dance Formations

An Honors Thesis (HONR499)

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Abstract

Dance is seldom associated with mathematics. Yet, dance formations, the arrangement of the performers on stage, are based upon clever number manipulation. The primary factor of a formation is its number of performers. Once known, the choreographer will typically have a shape to arrange the performers in mind. Then, the challenge becomes how to achieve the desired shape given the number of performers. This is a process that occurs each time a choreographer wishes to make a formation, typically using paper and pencil, trial and error.

In order to remedy this time-consuming process, several developers have published web and mobile applications which either provide formations created by hand themselves, or allow choreographers to construct their formations in a digital environment. Since common dance formations are geometric in appearance and follow certain patterns, mathematics and programming are able to automate this process. Determining closed form equations that verify formations for any number of performers, and writing code which produces visualizations of formations, makes the burden of creating dance formations a challenge of the past.

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