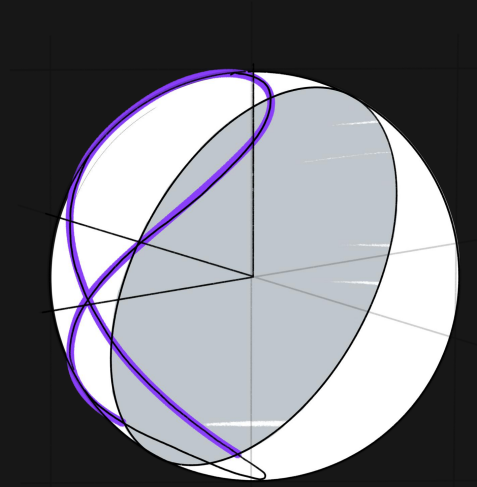
Hearing Quantum Evolution



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Qiskit

Qiskit

“Where words fail, music speaks.”

Hans Christian Andersen

Introduction

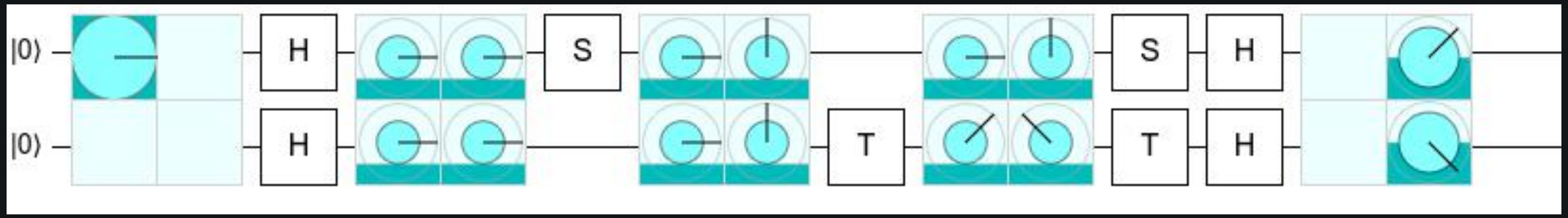
Principle : Evolution in Quantum States lead to change in 2^n basis states(Evolution of Amplitude and Phase).The change in the Quantum State of a system can be modelled by using unitary matrices.The unitary matrices could then be used to generate 2^n wave patterns , with a Amplitude and Frequency.

Approach : We plan to use the simulator provided by Qiskit to model this evolution and compute the wave pattern governing it , which we then plan to use to synthesize audio to listen to those unobservable but fundamental melodies.

Introduction

Qiskit

Example:



(Quirk)

Deliverables

Qiskit

We plan to develop a standalone platform that will look to provide a mean to accept a Quantum Circuit , map the Unitary Matrices optained during evolution of the Quantum States of the system , and map the change and represent it in a form of a audio wave , with amplitude representing the change in amplitude of the state and the frequency representing the change in the phase of the system.The same could be used in reverse order , where a particular melody could be represented as a set of gates representing a change in state of the quantum system.

The platform will also allow visualization of the various Quantum Computing Algorithm by passing thier corresponding circuits and optaining a synthesized audio wave , which could provide a new way of understanding algorithms.

Timeline/Our Approach

April – Each member will make their own way of generating sound/effects and implement each of them as a function, using their own choice of open source library/packages.

May – Combine them, refactor them and create a miscellany of combinations.

We're currently researching the creative ways of conversion/creation of sound.While we're talking about midi/frequency, there are infinite combinations and solutions to generate music from the Quantum States.

Therefore, our project requires the time and i n s p i r a t i o n (duh)

Thank You