**Extended Essay Proposal Form**

Please submit this form to your supervisor and meet with him/her at least once before you’ve got approval from him/her.

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| Student’s ID: 2022512  Student’s name: Suni Yao | Supervisor’s name: Yan Qin |
| Summary of Review   * (you need to list at least **three Extended Essays** you read and **one article or book or relevant material** which is related with your proposal.) * Please make sure you include proper citation.   **The EEs:**   1. To what extent do the motion of strings within stringed instruments described by Fourier Series give insight into consonance and dissonance in music theory?   <https://www.clastify.com/ee/maths/61743ae0610b200013237d2c>   1. How does the Fourier Series is used as a musical signal for chord structure?   <https://www.clastify.com/ee/maths/65c119341c3e1a8835badc9a>   1. How are elliptic curves used in cryptography to make information secure in today’s world?   <https://www.clastify.com/ee/maths/64a7cb73701b5600139b5048>   1. How does Elliptic Curve Cryptography ensure secure communication of information on the internet?   <https://www.clastify.com/ee/maths/64ac374b7345620013099d36>  **The article or book or relevant material:**  Bryan, Kurt, and Tanya Leise. "Making do with less: an introduction to compressed sensing." Siam Review 55.3 (2013): 547-566. | |
| Subject area: Math AAHL  *Please choose one of the following (please tick* ***a*** *if you choose the subject in Group 4; tick* ***b.*** *for the other subjects) and write down the content as instructed by your EE supervisor:*  **( )a. Direction of the research(for subject in Group 4):**  **( ✔ )b. Possible topic(for subject in other groups):**  The Extension of Marble Problem onto Analysis of Instruments in A Given Recording (How Can The Marble Problem Be Extended for Analyzing The Existence of Music Instruments in A Given Record?)  The goal of the exploration is to   1. Introduce how the method of determine how many and which marbles are “bad marbles” can be solved quicker using the compressed sensing method 2. Extend the marble problem onto the analysis of existence of music instruments in a given music clip’s Fourier analysis. | |
| After reading this proposal and meeting with the student, I agree to be his/her EE supervisor.  Supervisor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |