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# Magellan Scholar Mentor Collaboration Form

**Student name:** Matthew Corley How long have you known student? 1 year

**Section I: Please comment briefly on the strengths and weaknesses of the applicant.** Please include such factors as intellectual ability, research and writing ability, analytical skills, initiative and maturity, and level of independence (novice through advanced).

Matthew Corley is among the brightest and most talented undergraduates I have met. Since meeting him last year, when he was a sophomore and served as my grader for an upper level math class, it has been a pleasure to work with him.

Matt and I worked together on a project over the summer and we developed a very efficient and productive project workflow using robust tools like the Git revision control system. This enables us to contribute simultaneously on a project and keep a detailed history of all contributions. We have set up a GitHub team for the proposed project, and the associated website can be found at <http://soundmath.github.io/GroupSound/>

Matt has already taken advance mathematics classes, and has built a solid foundation, but perhaps more important for a project like this is his exceptionally high aptitude for technical subjects. I can explain challenging, even deep mathematical ideas to Matt and he understands surprisingly quickly. I have not achieved this level of communication with any other undergraduate, and only rarely with graduate students.

Matt is very motivated and ambitious, and seems eager to undertake research at a high level. He is an independent thinker and shows strong potential for making original contributions to mathematics and computer science. I think Matt is ideally suited for the research outlined in his proposal, and it will be my pleasure to be his mentor on this project.

I have no doubt in Matt's ability to successfully complete this project and reach the goals and objectives he describes in the project proposal. I expect him to make many interesting new discoveries in this relatively unexplored area.

**Section II: Briefly describe how you will be working with the student during this project.** Please address the concrete ways you will help the applicant develop the skills and techniques needed to complete project.

Matt and I will meet regularly, once every two weeks or so, to discuss his progress. At each meeting, especially at the start, I will teach him more about group theory and the basic mathematical principles underlying signal processing and harmonic analysis. Matt, in turn, will continue to teach me about software development, and we will discuss progress he has made with both the mathematical and software development aspects of the project. We have already met a few times to discuss some of the mathematical background and, as expected, Matt has quickly picked up some of the most the important principles needed for research in this area.

Matt will also meet with his co-mentor, Professor Reginald Bain, in the Music Department to learn the basic principles of musical acoustics, musical analysis and synthesis, and computer music composition---subjects that are integral to the proposed project.

I will coach Matt as he prepares to present his results at Discovery Day as well as other international mathematics and music conferences. Finally, with the help of Dr. Bain, I will advise Matt about prospects for publishing his results in major academic journals in the field of computer music, musical acoustics, or applied math.

1) **Based on your knowledge of the applicant's abilities and personal characteristics, please rate your recommendation of this candidate for a Magellan Scholar award.**

☒ Very Highly Recommend ☐ Highly Recommend ☐ Recommend With Reservations ☐ Do Not Recommend

2) ☒ (please check) **By submitting this form, I confirm that the student applicant was the primary author and the text created is largely his/her own work.**

**Mentor Name:** William DeMeo