

# OPPONENT RECORD

**Thesis compiled by**

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**Title of thesis:**

**An Algorithm for Optimal Guitar Fingering**

**Opponent:**

**Niklas Rosén**

**Was it easy to understand the underlying purpose of the project?**

**To what degree did the author justify his/her choice of method of tackling the problem?**

**Is the method adequately described? Comments.**

The goal of the study performed is clearly stated as "[...]to implement and evaluate an algorithm that proposes a guitar fingering for a given sequence of notes.". The introduction and background also presents reasons why this would be interesting to study. What is not explicitly stated and thus not completely clear from the text is how it will be evaluated and what purpose this study has in relation to existing work in the domain. E.g. if the study is meant to be a verification of earlier results, an attempt to improve upon earlier works or if it studies some unexplored or previously neglected aspects of the problem, just to mention a few possibilities. The general feeling I get is that the purpose is to find out if an automatic fingering generator would be feasible and useful, this is however not stated. Because there is no explicit problem statement, i.e. why or to what end this study is made, there is no mention of why it has been performed the way it has, ergo the choice of method is not motivated. The method is on the other hand well described and some choices of scope and design choices in the algorithm are well motivated. Examples are the choices to prefer a beginners point of view to that of a professional as well as using the top-down optimization approach to the algorithm. To conclude; this report would benefit from stating a clear purpose and some motivation for the used approach.

**Do you consider that the report title justly reflects the contents of the report?**

"An Algorithm for Optimal Guitar Fingering" describes the contents well as this is exactly what is studied. It does not address what is done with this algorithm e.g. if it is developed, examined or improved upon. But only so much can be expected from a title and this one is fully adequate.

**How did the author describe the project background? Was there an introduction and general survey of this area?**

The project background was well described. First an introduction was presented, detailing the underlying difficulties in choosing a fingering and how this is usually handled by guitarists. Then it is proposed how the problem can be approached algorithmically and this is related to previous work and differences and similarities between approaches are outlined. This provides for a good holistic understanding of the problem adequate for the scope of the report.

**Has the author set out his/her results clearly and concisely?**

The results are presented in the form of a few of the most notable problems or oddities with the generated fingerings and while this is not exhaustive and quite subjective it does provide a good understanding of the limitations of the algorithm, which is one of the most relevant results.

**Do you consider the author's conclusions to be credible?**

The authors conclude that the algorithm is subpar compared to experienced humans but that it with some further development to support polyphonic music and some tweaking of the rules can become a useful tool and help for beginners. I think this is credible and agree that this can be concluded from the results presented.

**What is your opinion of the bibliography? What types of literature are included? Do you feel they are relevant?**

The material referenced seems to be mainly music journals and scientific papers. Without reading the material myself it is hard to know for sure how credible and relevant these are but my general impression is that these sources are reliable and adequate for this report.

**Which sections of the report were difficult to understand?**

The results and the discussion of the results were a bit difficult for me to understand. The results discuss certain fingerings for certain passages of music and how this could have been done better. Without experience of music, playing guitar and reading bar notation, this can be a bit difficult to follow. In the discussion of the results the examples of the previous section are referenced and possible reasons for the generated fingerings as well as possible solutions are discussed. If the results were found a bit hard to follow, chances are that not all are remembered and one will have to alternate between the results and the discussion in order to fully understand the discussion. Also some notation might be needed from the appendix. These problems may be hard to alleviate as the subject is closely related to musical notation and the workings of a guitar. One thing that might help is to mention the issue or some characteristics of it when the results are referenced for discussion.

**What are the weaker features of the work/report?**

To me one of the most noticeable weaknesses of the report is the is the required knowledge of guitar playing needed to fully understand, and understand the implications of, the results. This translates to a lot of time and effort required by an uninitiated reader. This may be helped by shifting the focus from guitar playing and using a more algorithmic approach as many of the results were structural in nature, e.g. shifting fingering just to shift back a couple of notes later. Such an approach may on the other hand obscure the results from people with adequate background and how this should be balanced depends on the intended audience.

**What are the stronger features of the work/report?**

One of the strong features of this report is the background and the description of the algorithm as these together give a clear and holistic view of the problem and the proposed solution. From the underlying difficulty of choosing fingerings to the strength and weaknesses of the chosen algorithm as well as how it relates to other proposed algorithms.

**What is your estimation of the news value of the work?**

It is extremely difficult to estimate the news value of this study without being familiar with the earlier work in this domain, which I am not. As approaches said to be similar are referenced in this work I

would suspect that similar results have been had before. Even if the results presented are not groundbreaking or new there is still some news value in that they have been repeated and confirmed.

**Summarize the work in a few lines.**

Presented in this report is a study of an algorithm for generating guitar fingerings and the results. This is preceded by an explanation of the difficulty of choosing fingerings, that this is usually done by intuition and experience and some earlier approaches to automatic generation. The algorithm and its results are discussed and it is concluded that with some fine tuning of the parameters, and further development for polyphonic music, this algorithm could potentially be a useful tool for beginning and professional guitar players.

**Questions to author:**

1.

What was the purpose of conducting this study?

2.

Judging from the research and the study you have done, do you believe that it is feasible to automatically generate fingerings on par with those generated by expert humans?