

March 30, 2015

Dear Faculty Advisor,

Thanks for participating in the MCM. The author of this evaluation served as a judge during the A Problem judging of the MCM. With respect to Contest Paper 34691, he or she is providing constructive feedback from both an absolute sense of how this paper treated a requirement and how it compared to the field of papers entered in the contest. Additionally, comments are provided relative to several issues that discriminated the better papers from the rest.

A word of caution: Your team's paper is being compared against the entire field of **7636** A Problem contest papers submitted. The typical university has one or two A Problem teams consisting of three of the best modeling students at that school. Comments provided in what follows are aggregating against all papers seen by the author during the contest. There are discriminators identified below that perhaps only a very few, say one or two, Outstanding teams addressed. Hopefully, what is revealed in this note are particulars regarding how your team performed absolutely against the requirements of the problem and how they performed relative to the field against the discriminators identified. We hope these comments will highlight areas in which future team's work could be improved.

The first table in what is to follow is an analysis of paper **34691** in relation to the stated requirements of the problem and in relation to the performance of other teams.

The second table has data indicating how your team's paper performed relative the discriminators listed. Discriminators are identified during the entire judging process.

Above all, it is frankly amazing what a small group of students can achieve in such a short period of time regardless of the outcome of contest judging. Experience has demonstrated that much of the credit for them being able to do so rests on the faculty advisor. So, thank you for volunteering your time, energy, and talents to helping develop our future mathematicians, scientists, and engineers.

Requirements for Problem A

REQUIREMENT	Fulfillment	Relative to other papers
Proper documentation	Excellent references in this	Not competitive with better
throughout the paper and in the	project, good research.	papers, which incorporate
references section	Citations good early on,	more real data in models and
	insufficient in later sections	which cite sources throughout
Non-technical letter explains the	Not provided, a required	To do well, a project must
results and model in	element of the project	satisfy the stated
approximately one page		requirements
Executive Summary motivates	This summary reads well,	Better papers give
the reader, contains results	and says what types of	information on what the
consistent with paper.	models are employed, but	models determine
	gives no real conclusions	
Coherently & well written paper		
addressing:		
1. Restatement of the Problem	Good	Have more detailed discussion
		of the problem and the
		approach taken
2. Assumptions with rationale	Good	Have more detailed
or justification that lead to the		treatment.
model used		
3. Model Design and	Good	More than the simple SIR
Justification with a clear		model. More detailed
modeling process to obtain		distribution model,
results		incorporating data on
		population distribution and
		transport options
4. Model Testing and/or	Good discussion	
Sensitivity/Error Analysis		
5. Relevant strengths and	Some, better than most	More detailed discussion
weaknesses		
6. Provides algorithms or flow	Did not really develop these	
diagrams for any computer code		
implementation (not the code)		
7. Conciseness and organization	Good, though incomplete	
of document		
8. Answers each specific	Modeling of virus spread	More information on specifics
problem posed	and of how to distribute	of delivery system would be
	medicine	better

Discriminators for Problem A

Discriminator/ Issue	Performance against the Field	
Did the team model the spread of Ebola in the	Yes, but with only a basic model	
region (by countries or sections) to prioritize		
medicines and delivery?		
Did the team address the involvement of	Somewhat, though virus model centered only	
multiple countries in their modeling?	on Guinea	
Did the team use their results for the spread of	Not clearly, but hardly any teams did this well	
the disease in the decision process for		
medicine delivery and schedules?		
Did the team provide an overall assessment of	Yes	
what their models will accomplish?		
Did the team perform useful sensitivity issues	Good discussion	
for subjective as well as objective inputs?		
Did the team use a method that allowed for	Yes, at least they are aware of important	
analysis and testing the model? How did they	issues	
deal with uncertainty issues in data selection?		
Are graphs and charts clearly labeled and	Yes	
properly cited and do they add clarity to the		
discussion?		
Can their model be validated?	In principle, yes	
If they used another's model from the	The virus SIR-type model is similar to the	
literature, did the team show value-added in	literature, but combining it with the Markov	
its use?	chain network model is new	

This is an intense contest, and I want to point out things that would be needed to create a more competitive project.

This paper contains interesting discussion and reads better than most. Maybe the team ran out of time? The summary contains too few details, and there is no letter at all (a requirement), which may be why the rating is not higher. It would be better to treat several of the key Ebola outbreak countries, not only Guinea. Specific strategies for distributing the medicine in each of the main countries dealing with Ebola need to be given, and the model should show how the medicine will help.

Anyway, the team should be congratulated for its hard work. With some more effort/time, this could be expanded into an excellent paper.

Overall, the team paper received a contest rating of Successful participant

Sincerely,

MCM Contest Coordinator