NIMBioS

Evaluation Summary Report
Tutorial: *Parameter Estimation for Dynamic Biological Models*
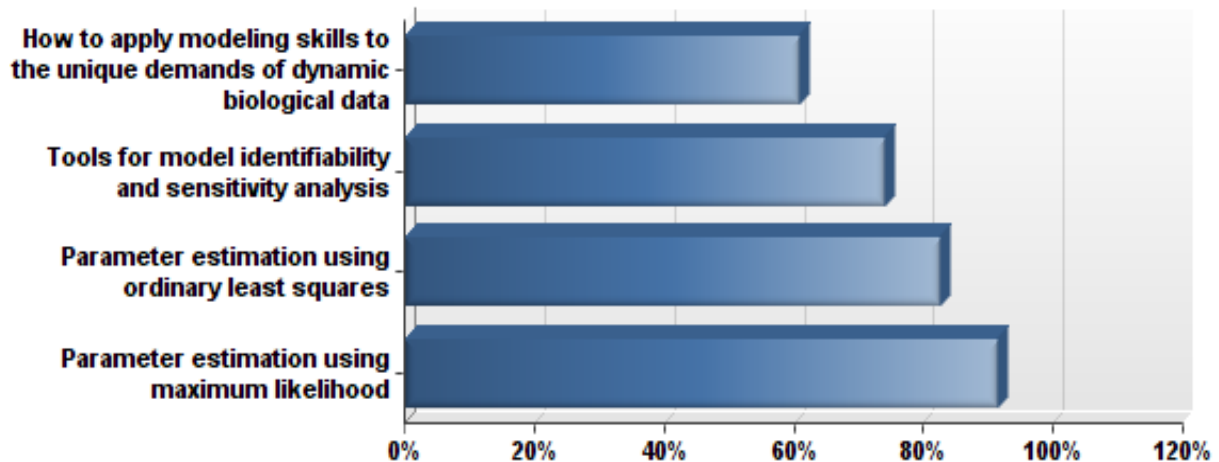
May 19-21, 2014

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Evaluation Manager
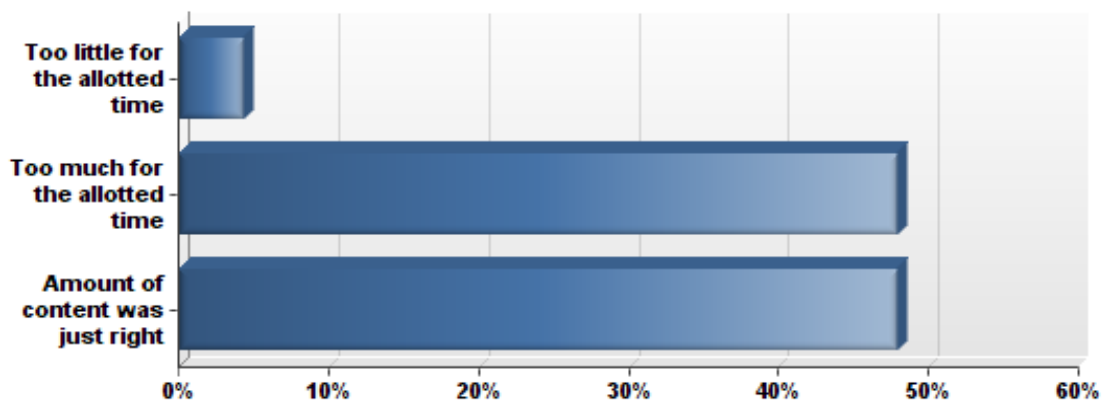National Institute for Mathematical and Biological Synthesis
June, 2014

1. Please indicate your level of agreement with the following statements about this tutorial:

Legend: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

- This tutorial was appropriate to my level of expertise.
- This tutorial met my expectations.
- The hands-on exercises were useful.
- The presentations were useful.
- The instructors were very knowledgeable about their topics.
- The group discussions were useful.
- I would recommend participating in NIMBioS tutorials to my colleagues.

2. As a result of participating in this tutorial, I have a better understanding of:

- How to apply modeling skills to the unique demands of dynamic biological data
- Tools for model identifiability and sensitivity analysis
- Parameter estimation using ordinary least squares
- Parameter estimation using maximum likelihood

3. How do you feel about the amount of content offered during the tutorial?

- Too little for the allotted time
- Too much for the allotted time
- Amount of content was just right

4. What topics would you have liked to have covered in this tutorial if given more time?

More details on uncertainty analysis, and methods related to Bayesian analysis.

I would like to have more time working on the questions and code, or even a chance to work on my own data. Also, it would be great if we have had time to build up a team to work on a proposal for collaboration. NIMBioS has many experts and I would like to know them more.

Bayesian methods

Going over the activities after we tried them would have been helpful.

More emphasis on hands-on model fitting, including walk-through of the code provided. Because the majority of us will likely be using maximum likelihood to fit models to data, more examples using a likelihood function (rather than sum of squares) would have been helpful.

Bayesian parameter estimation and examples with stochastic models

Walk-throughs of final code after exercises completed.

More advanced examples

I would have liked to explore the concepts presented in more detail - both theoretical and code-wise.

Bayesian parameter estimation approaches.

A more thorough hands-on walk-through from start to finish: identifiability, parameter estimation, uncertainty analysis, sensitivity analysis

We need longer tutorial session for parameter estimation. Just two and half days are not enough. We want more methods and material for parameter estimation. Also if we had longer time we would have chance to practice and ask the organizers any questions we have/

The topics covered were sufficient. If given more time, I would not want more content but more time to work on the exercises.

Need more help on hands on exercises. In other words, more tutors will be helpful during lab time.

- Global sensitivity analysis - Parameter estimation when data is more complicated, for ex: oscillatory

I would have like to see more on the distinction between available methods of parameter estimation, primarily in the advantages and disadvantages of some of the more common methods that people use, whether in MatLab or R.

More MLE

5. What do you feel was the most useful aspect of the tutorial?

Simple method for compartment modeling

Concepts and code.

Exercises were most useful, but we often ran out of time and did not finish all of them or reviewed as a class to make sure we are all on the same page.

Seeing the material in practice via activities.

Great overview of concepts necessary to understand model fitting, overall good laboratory exercises.

That all the topics covered in the lectures were implemented during the hand on exercises.

Exercises in R; conceptual descriptions of how various methods worked.

Identifiability

The breadth of the topics covered.

Hands on programming examples that solidified the concepts.

The hands-on portion related to identifiability would have been the most useful for me, but we didn't have enough time to even get through the first part. So, I still don't feel like I can implement this material like I would like.

Some of the aspects like bootstrap, parameter idntifiabiality, fminsearch were useful

The hands-on exercises that we did during the workshop, the lecture notes that were posted, the sample codes that were given to us before the exercises. The instructors were very nice and helpful.

The hands-on exercises

Lectures. But I also like hands on exercises. The only problem that I got is that I got stuck with my program some time and make no progress.

The lab exercises and the opportunity to collaborate with others to solve the exercises

Reviewing a lot of what I learned in the past and seeing it presented in a slightly different way, the introduction to FIM, and the hands-on labs were great!

I thought that the lecture-exercise format was extremely useful to get a handle on some of the ideas discussed.

Code! "Labs"

6. What would you change about the tutorial?

Two and a half day is a little bit shorter.

For the topics that I am more familiar with (e.g. MLE and LS), I had little problem understanding the presentations. Nevertheless, for the materials that I had been unfamiliar before the tutorial, I had more difficulty absorbing them. I would tend to believe this probably is the same for many others. It would be great to spend more time on the things that I really need to know more about.

Make it longer. A lot of topics were covered but felt rushed some of the time, especially during exercises.

Each section was a bit rushed at times, especially activities. This means a good deal of material was presented, it was just hard to complete an activity before moving on to the next topic.

There should be more details about what exactly to do, how to interpret the output, and how to choose which model to do, but less on the explanation of equations; and need more activities with data that can be analyzed with the different methods (instead of new data for each method).

More emphasis on likelihood rather than least squares in the labs, more explanation of R / Matlab code.

Maybe more time is needed because it was practically impossible to finish the hands on exercises.

It was very cumbersome, having exercises in two different programs (Matlab and R). If the course continues to be offered in two programs, it would be helpful to have full code for all the exercises in both languages. I wanted to use R, which meant that I needed to spend course time translating Matlab code to R code.   A bit too 'math.' I would have preferred a greater emphasis on the conceptual frameworks behind different methods, with step-by-step instructions of how to use them in R, with less emphasis given to detailed equations and mathematical proofs (except where those are necessary to write the R code). I felt like a lot of the course material was only useful for math majors, not for biologists. I'd prefer more time spent on practical examples, and less on the equations behind these concepts.

Some overlap in the topics could be removed to allow for more time for hands on.

I think it would be useful to run the programming examples on only one or two datasets, rather than changing data each exercise.

More time for the hands-on portion.

Make the longer tutorial

Maybe give some references or reading ahead of time for those interested.

It was a great effort on the part of NIMBioS to arrange for Matlab and other soft wares for all the participants. However the signal was too slow to do anything on it. So I feel it was more of a distraction than help. We spend a lot of time downloading and setting up to use that feature which wasn't very practical.   In future, I would recommend that the tutorial organizers tell the participants to arrange for their own softwares prior to showing up for the workshop, if they can. Otherwise, NIMBioS can provide computers which has the softwares (like they used to do before, 2008 I think).

Move along the content in the first day faster in order to have more time to spend on the exercises.

How to link the topics among them and how to present the topics in order to give them a context in the research. How do they come together?
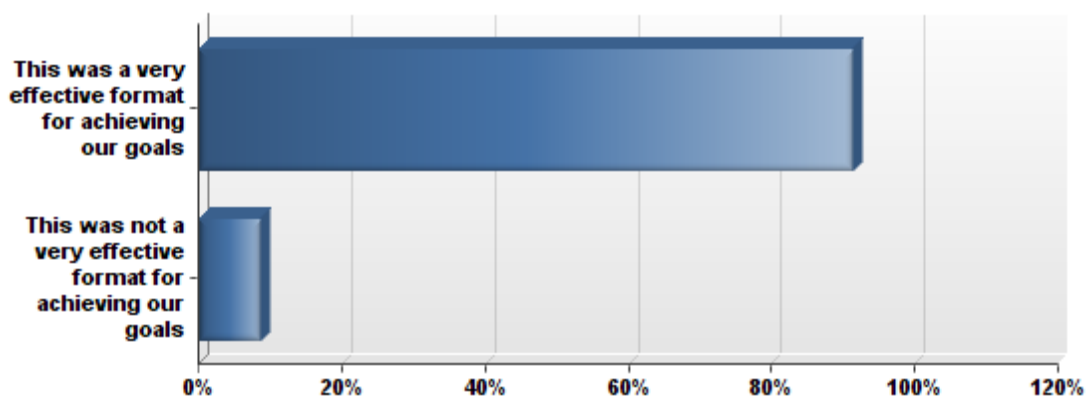
The hands-on tutorials were too long relative to the time given for them.

Some of the labs could be paired down for the time we had at NIMBioS, but I don't mind that I have more I can work on my own time. It's better to have a little more to do than not enough since participants will naturally work at different paces, depending on their background.

If the tutorial was extended by a day or a half day, I think it would be useful to allot more time for working on the exercises. Also, prior to the start of the tutorial, I think it would have been useful to receive an email regarding software requirements (or updates made to the website). The blog site was updated very close to the start of the workshop, so it seemed as though many people were unaware of what was required before it was too late.
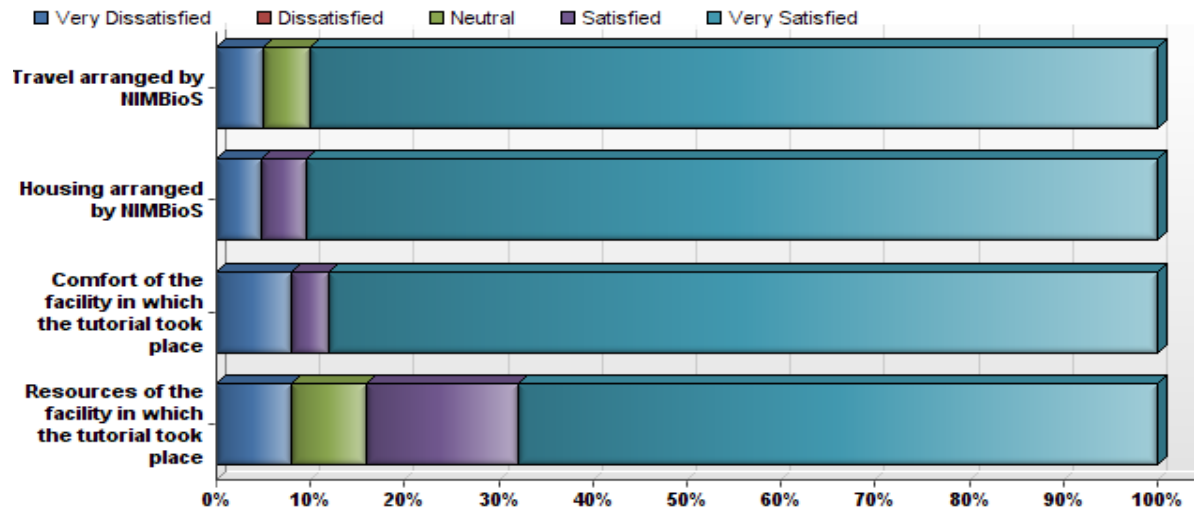
Less linear algebra

7. How do you feel about the format of the tutorial?

8. The tutorial format would have been more effective if:

No responses

9. Please indicate your level of satisfaction with the tutorial accommodations:

10. Comments about accommodations:

The internet connection to server (for Matlab) was too slow.

Great.

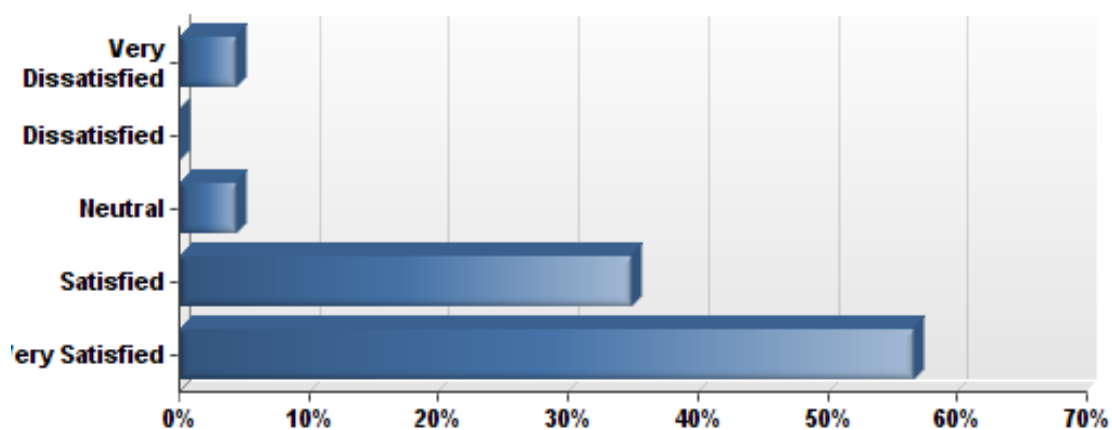*It was great that NIMBioS took care of all arrangements, made traveling so much easier.*

Great.

Server is too slow to run Matlab

Maybe a list with pharmacies and grocery stores and restaurants in the area.

I can't complain much, but if I had to pick on something, I would suggest not having half-days, because some of us cannot really travel home in an afternoon. I would feel much more comfortable departing in the morning, but I also didn't want to miss any of the tutorials, particularly since it was already short.

11. How satisfied were you with the opportunities provided during tutorial presentations and discussions to ask questions and/or make comments?

12. Please indicate any suggestions you have for facilitating communication among participants during the tutorial:

Small group discussions would allow us to help each other. It seems to me that the tutors were busy working around in the room. Not everyone could have got assistance in time.

Start communicating before the tutorial begins. This could include background reading material, sharing reasons for taking the tutorial or other ways that would help direct the material presented.

13. Additional comments:

Thanks for the tutorial. It was a great experience for me.

I thought the leaders did a great job. I would really appreciate if they would eventually post the activity solutions, references and other material they said they would.

Just want to thank NIMBioS and the organizers for the opportunity to participate in the tutorial.

Thanks for putting this together!

Thanks very much for such a great experience. I leant a lot, not just from the presenters but from other attendees to the workshop. Also, i had the opportunity to network with other NIMBioS affiliates.

Thanks for putting all this together! We had a great experience organizing at NIMBioS---everyone was really helpful, friendly, and flexible with arranging things, even with some last minute changes. Thanks!

Great tutorial - I really enjoyed it! Perhaps the level of the content could have been better advertised, but even the parts that were review, I found useful. Maybe there could be a part 2?

I found this tutorial to be extremely informative and helpful. The organizers did a great job.

Really great workshop! The organizers were wonderful.