Tutorial Evaluation Data Report
Multi-cell, Multi-scale Modeling
May 18-21, 2011

Pamela Bishop
Program Evaluation Coordinator
National Institute for Mathematical and Biological Synthesis
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Evaluation Design

Evaluation Questions

The evaluation of this tutorial was both formative and summative in nature, in that the data collected from respondents was intended to both gain feedback from respondents about the quality of the current tutorial and also to inform future similar events. The evaluation framework was guided by Kirkpatrick's Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994[1]). Several questions constituted the foundation for the evaluation:

1. Were participants satisfied with the tutorial overall?
2. Did the tutorial meet participant expectations?
3. Was the tutorial appropriate to the participants' levels of expertise?
4. Did participants feel they learned an appropriate amount of information?
5. Were participants satisfied with the amount of content and format of the tutorial?
6. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

Evaluation Procedures

An electronic survey aligned to the evaluation questions was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director and Deputy Director. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to 22 tutorial participants on May 21, 2011 (tutorial organizers and participants associated with NIMBioS were excluded from the evaluation). Reminder emails were sent to non-responding participants on May 26 and 31, 2011. By June 6, 2011, 22 participants had given their feedback, for a response rate of 100%.

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[1] From Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels.* San Francisco, CA: Berrett-Koehler.

Evaluation Findings

Respondent Satisfaction

**Figure 1. Satisfaction with various aspects of tutorial**

Scale: -2 = Strongly disagree to 2 = Strongly agree
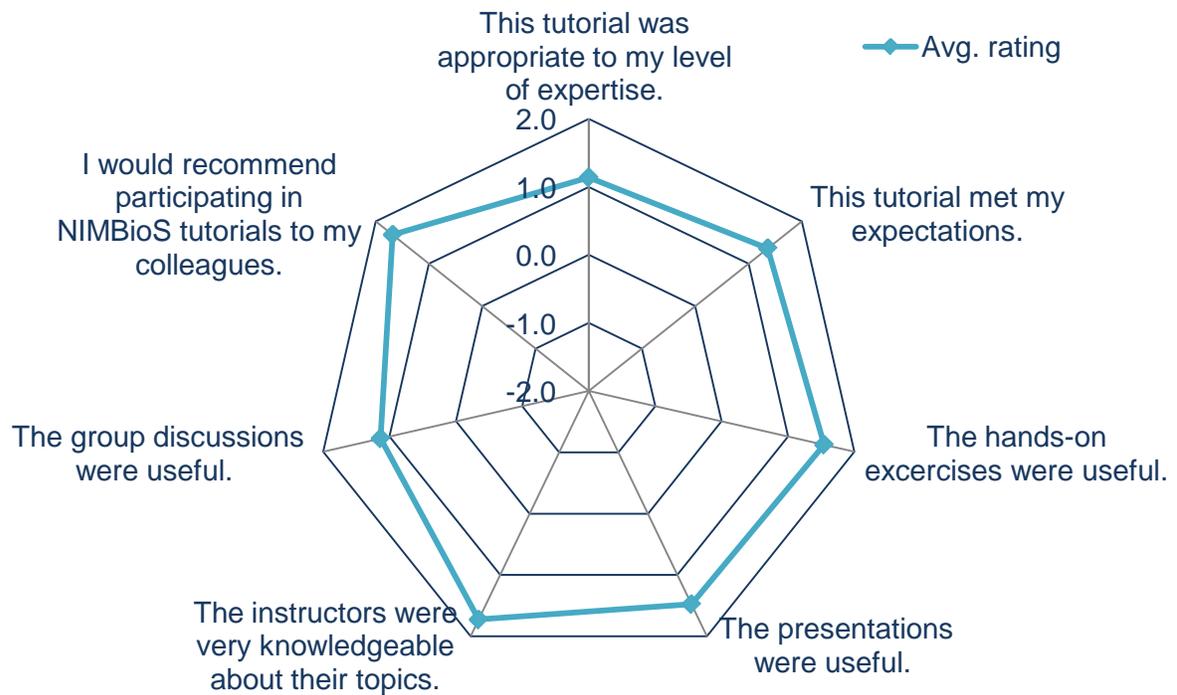
Tutorial Format and Content

Format
Figure 2. Satisfaction with opportunities provided to ask questions and/or make comments
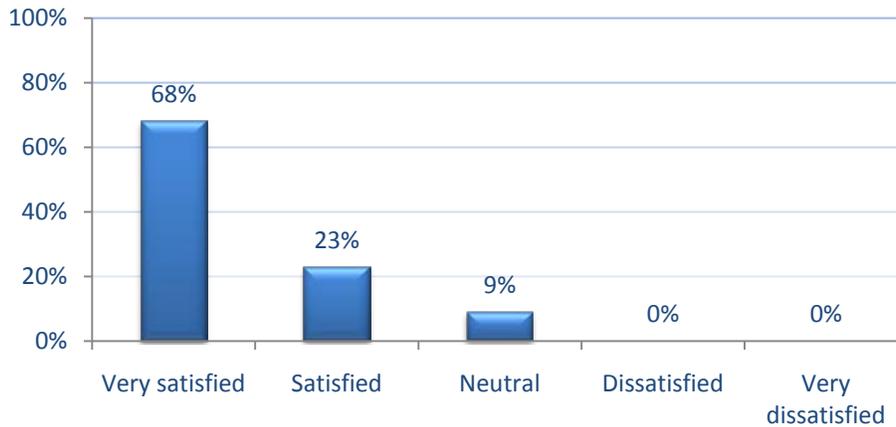
Please indicate any suggestions you have for facilitating communication among participants during the tutorial

Feel the time is short for some content.

Group work.

Have participants shift around and partner with each other one-on-one - this could be done at random

I feel that this was the best format available to have an open discussion about the modeling concerns of CompuCell3D as well as to ask questions about issues we were having.

It'd be better to ask the participants to give a presentation to introduce their own researches.

There were many interruptions during the tutorials. Perhaps groupings of people from diverse backgrounds could work together, helping any stragglers and promoting cooperative learning.

The one-on-one sessions with CCD3 programmers were useful. At some point I got lost and seemed so far behind the few of the others that were following the presenter that I just quit entering Python code and listened. Suggest to have time for participants to work in pair's or three's on tasks outlined by the presenter, so that the participants could complement each other if one gets stuck or doesn't understand an aspect of the task.

Figure 3. Effectiveness of tutorial format
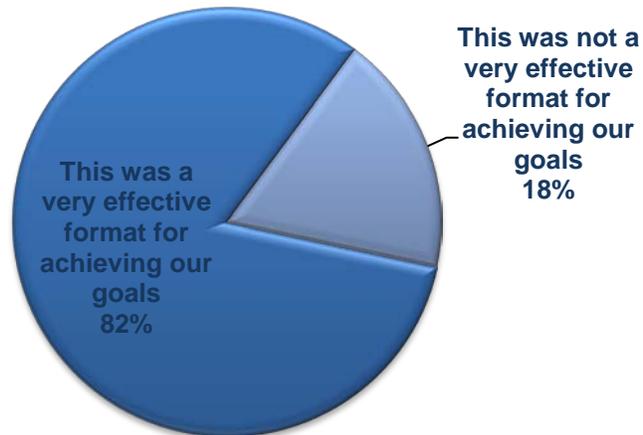
The tutorial format would have been more effective if:

Too much too quickly (for me and at least half of the participants). For me it served as an effective introduction of what can be accomplished with CC3D but not how. I left inspired but frustrated.

The classroom assistants need to be a little "forceful" in approaching the participants and not wait until they are called upon to help; some people are reluctant to demonstrate "ignorance". Although there was a very friendly atmosphere conducive to learning.

We had a product in mind at the end of the tutorial. Although, I think they would have had us create a simulation but there was not enough time.

Content
Figure 4. Amount of content provided
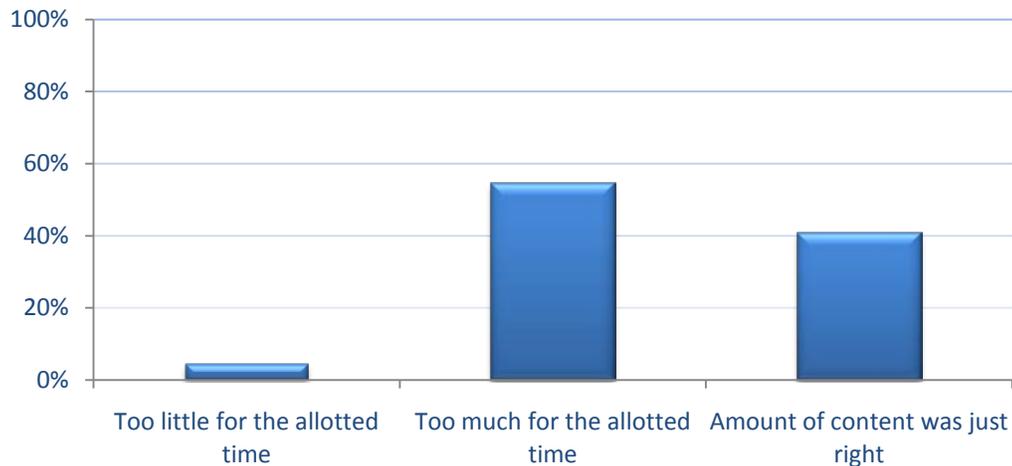
What do you feel was the most useful aspect of the tutorial?

Being able to program and having the software on my own PC

For me as a computer scientist, it was learning to work with biologists and communicating with a shared vocabulary. I learned biology better by helping biologists program what they wanted and expected.

Hands on demos.

Introduced me to modeling with compucell3d.

James Glazier's introduction to CC3D and the modeling perspective, Randy's intro to Python, Maciej's range of topics demonstrated (although I got lost and did not follow each), Julio's presentation. The availability of the PowerPoint slides so that I can review the material presented so fast that I could not keep up. The one-on-one help from the programmer staff members.

Learning how to do some simulations.

Learning Python and the interaction with CC3D.

Examples.

Python.

SBW and its conversion to CC3D.

Seeing how much can be done with CC3D was fascinating. I really enjoyed the python scripting but it would have been useful to have worked out more hands-on examples with it. I feel that

towards the end, when we had to go in depth with python, we were running out of time and it seemed rushed.

Since my research involves sub cellular modeling, I found great interest in information regarding SBMLs incorporation into CompuCell3D.

Sitting down with the people who created the software during an open session.

Steppable development and sbml integration.

The exercises and one on one time with the instructors.

The variety of features that you could do with the software.

The way they think to model. Instead of update the whole in one step, only consider the local. Thus, some instability is avoided.

To discuss aspects of programming and modeling with other participants.

Use of the software through Python and XML scripting.

The introduction to how to use CompuCell3D.

Suggestions for Future Tutorials

What would you change about the tutorial?

1. It'd be better to reorder the lectures. That is, to give the same contents continuously; 2. When it comes to the codes of the examples, it'd be better to add the comments to the codes.

2 projectors is necessary, one for the presenter to modify the code etc and show the slides, and the other projector for the presenter to work in the simulation windows. Often before we understood what was being modified or changed in the code the window would switch to compucell window and people would get lost very easily, at some point one of the presenters was only with the four people in the front row, and the rest was completely lost and had started working on different things on their laptops, so it would be good if the presenters made sure at least half of the class is on board.

CompuCell3D is a great piece of software; unfortunately three days of workshop lectures doesn't do this software justice to the amount of things it is capable of. I would have liked for this tutorial to be extended over a week's time. I will look for more CompuCell3D tutorials to attend.

Either more time or less material.

Give more time because there is a lot of information to cover.

Increasing the length of the tutorial.

Introduction to python can be skipped. Participants should come prepared.

It should be easier to follow. The examples on the screen should be documented so that the user can read step-by-step.

It would be better given on a 2 week time period; although I know the organizers are aware of this.

Lengthen the tutorial.

Make it longer.

More hands on time.

More instruction on python.

More time to go through the exercises.

Not being a programmer, before the course I did some Python tutorials online as suggested, and they were useful. I was able to follow some of the material, but soon found that I was too slow and was overwhelmed on Thursday with Maciej's later presentations. So I just watched and learned the variety and depth of what can be accomplished, as a survey. I noticed that I was not the only one lost at times. Several people followed without difficulty, but I noticed that many others did not (did email or surfed the web.) Perhaps it should be recognized that there are different levels or speeds of presentation that would be better for different audiences. This might be taken into account in advertising the tutorial, and in making the presentations.

Nothing-just go slowly-lecture was give at fast pace.

Slower examples and more allocated time.

Too much stuffed into a short time.

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

All topics need more time to understand completely.

Build a 2d cancer simulator with angiogenesis.

How to modify Compucell3d original code and compile it from scratch.

I would have liked to bring in a specific exercise that I am working on and while working through the course adapt what I was learning. Attempt to apply the

new knowledge to tackle the said exercise. This is time consuming. An alternative would be: perhaps the course could develop exercises say in 3 categories with three teams; participants could register for any one of the categories ahead of time.

I would like to learn how to extend cc3d by using my own pde code in C++.

I would say more time needs to be emphasized on more hands-on training and less lecturing.

More information on how to incorporate sub cellular modeling via SBML into CompuCell3D would have been great. However, I understand the time constraints did not allow for every possible topic to be covered in full detail.

More on the theory behind the Cellular Potts model. Putting c++ code into the application and rebuilding. But the course was great in general for the allocated time.

More time devoted to working out examples with python scripting as well as setting parameter values would have been useful.

Parameter Estimation (How to tune the values of parameters?); More complex models of biological systems.

sbml and CC3D integration with sbml. C++ plugin development.

Sometimes less is more.

The angiogenesis of a tumor.

writing our own c++ plugins

Additional Comments

Please use this space for any additional comments:

Too much, too fast. Too great expectations for entering code to accomplish task suggested by presenter for most participants. If time is short, then present as demo but not expect that all participants can do the suggested Python tasks on the spot.

This was a great course that is fulfilling a huge demand across the biomedical research communities. Members of the faculty are highly motivated, energized and most willing to share their expertise.

Very friendly and encouraging research environment, thank you!

Appendix

Multi-cell, Multi-scale Tutorial Evaluation Survey

Multi-cell, Multi-scale Tutorial Evaluation Survey

Thank you for taking a moment to complete this survey. Your responses will be used to improve the tutorials hosted by the National Institute for Mathematical and Biological Synthesis. Information supplied on the survey will be confidential, and results will be reported only in the aggregate.

Please check the appropriate box to indicate your level of agreement with the following statements about this tutorial: (Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

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

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

Please check the appropriate box to indicate your level of agreement with the following statements. As a result of participating in this tutorial, I have a better understanding of: (Strongly agree, Agree, Neutral, Disagree, Strongly disagree)

> SBML, GGH and CC3D concepts
> Python scripting
> how to extend the modeling environments using C++ plugins
> how to translate parameters found in the literature into model parameters

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

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

What would you change about the tutorial?

How do you feel about the format of the tutorial?
> This was a very effective format
> This was not a very effective format
> > The tutorial format would have been more effective if:

How satisfied were you with the opportunities provided during tutorial presentations and discussions to ask questions and/or make comments?
> Very satisfied
> Satisfied
> Neutral
> Dissatisfied
> Very Dissatisfied

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

Please provide any additional comments about your overall experience with the tutorial: