



# Survey Research Laboratory

*A Unit of the College of Urban Planning and Public Affairs*

## GLCPC VIRTUAL SCHOOL OF COMPUTATIONAL SCIENCE & ENGINEERING: SUMMER SCHOOL ON ACCELERATORS AND GPUS

### FINAL ANALYTIC REPORT

*Prepared by*  
Linda Owens  
Sowmya Anand  
Lisa Kelly-Wilson

*October 2008*

Study 1048

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## I. INTRODUCTION

This report summarizes the results of a survey conducted by the organizers of the summer school on Accelerators and GPUs for Science & Engineering; GPUs and Multicores at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign (NCSA). The University of Illinois Survey Research Laboratory (SRL) assisted with the survey. SRL would like to gratefully acknowledge the assistance of one of the main organizers of the summer school, Dr. Umesh Thakkar, interim associate director for the Virtual School of Computational Science and Engineering (VSCSE) and senior research scientist at NCSA.

The study employed a Web-based design. Sowmya Anand and Linda Owens at SRL assisted in questionnaire development, programmed the Web survey instrument, managed the data collection process, and conducted data analysis. The questionnaire that was used to collect data is in Appendix A. The purpose of the survey was to obtain participants' feedback on the conduct and usefulness to them personally of the summer school.

The summer school sessions were held in the NCSA training room August 18-22, 2008. Prior to the feedback survey, summer school organizers provided SRL with a list of e-mail addresses of the 49 participants registered to attend the summer school and a second list of e-mail addresses of the 42 who would not be attending in person but would be participating remotely via video link.

On August 21, SRL sent an initial e-mail to all participants to check whether e-mails were successfully reaching them (see Appendix B). On August 22, SRL sent the invitation to the on-line survey to the attending and remote participants. The invite briefly described the purpose of the survey, explained their rights as survey participants, and then asked them to click on a link that would take them to the on-line questionnaire if they consented to participate (see e-mail text in Appendix C). Attending participants were given the opportunity to access the questionnaire and complete it during a planned feedback session at 10:00 A.M., during which time an SRL investigator was present in the NCSA training room to rectify any issues with attending participants not receiving invites and to answer any questions. Attending and remote participants who were unable to complete the questionnaire on August 22 were sent a reminder e-mail one week later, followed by a final reminder the following week. The text of the reminder message is included as Appendix D. Questionnaires were completed by 43 attending and 15 remote participants.

The survey was designed to collect feedback about participants' overall opinion of the summer school and about several specific aspects of it, including the facilities, the usefulness of the content to their own current and future work, and any gains in skills or abilities as a result of their participation. There were two questions that could be answered only by participants attending in person; thus, they were asked only of them. Similarly, four questions were asked only of remote participants. Finally, respondents answered a few questions about themselves. The sections below contain a description of the responses obtained, along with tables and figures. The text of open-ended responses is in Appendix E.

## II. RESULTS

### How to Read the Tables

Overall, the questionnaire included 35 questions. Of those, 21 were questions in which the response options were ordered five-point scales used to rate specific aspects of the summer school program. For example, four questions asked respondents to rate specific aspects of the program on a scale ranging from "very poor" to "excellent." Another two used a scale ranging from "not useful at all" to "extremely useful." Regardless of the response options, all of these 21 questions ranged in value from 1, which always indicates the lowest opinion on the scale, to 5, which always indicates the highest opinion. The responses to these questions are presented in Table 1.

**Table 1. Responses to Items with Five-Point Scales\***

Item	Value	RESPONSE CATEGORY:					MEAN
		1	2	3	4	5	
		Very poor	Poor	Average	Good	Excellent	
1	Overall, how would you rate the summer school on GPUs & Multicores? (n = 58) .....	—	—	5.2%	37.9%	56.9%	4.5
3 <sup>†</sup>	Overall, how would you rate the training room facility at the summer school? (n = 43).....	—	—	7.0%	32.6%	60.5%	4.5
4 <sup>†</sup>	How would you rate the quality of the meals served during the course of the summer school? (n = 43).....	—	—	9.3%	32.6%	58.1%	4.5
7	How would you rate the quality of the instruction you received at the summer school? (n = 58) .....	—	1.7%	8.6%	27.6%	62.1%	4.5
11	How would you rate the quality of the computational training provided by the summer school for accelerating your applications in science & engineering? (n = 58).....	—	1.7%	12.1%	63.8%	22.4%	4.1
		RESPONSE CATEGORY:					MEAN
		Not useful at all	Slightly useful	Moderately useful	Very useful	Extremely useful	
8	How would you rate the usefulness to you personally of the hands-on sessions at the summer school? (n = 56) .....	1.8%	3.6%	30.4%	46.4%	17.9%	3.8
14	How useful will the summer school follow-up projects be for your future career? (n = 58).....	3.4%	10.3%	36.2%	34.5%	15.5%	3.5
		RESPONSE CATEGORY:					MEAN
		Not at all	A little	A moderate amount	A lot	A great deal	
9	How much has the summer school contributed to advancing your understanding of algorithm styles suitable for accelerators? (n = 58).....	—	5.2%	27.6%	44.8%	22.4%	3.8
10	How much has the summer school contributed to your understanding of architectural performance considerations for developing applications? (n = 58) .....	—	—	22.4%	56.9%	20.7%	4.0
12	How much has your ability to use GPUs & Multicores for scientific computing increased as a result of attending the summer school? (n = 58).....	—	6.9%	31.0%	34.5%	27.6%	3.8
20	How much do you think your experience at the summer school will enhance the work you hope to accomplish as part of your fellowship? (n = 16).....	—	12.5%	37.5%	25.0%	25.0%	3.6
		RESPONSE CATEGORY:					MEAN
		Not confident at all	Slightly confident	Moderately confident	Very confident	Extremely confident	
13	How confident are you now that you can write code on your own for GPU or Multicore architecture? (n = 58).....	—	12.1%	41.4%	31.0%	15.5%	3.5
		RESPONSE CATEGORY:					MEAN
		Extremely unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Extremely likely	
15	How likely or unlikely are you to incorporate what you learned at the summer school into your own work over the next 12 months? (n = 58).....	1.7%	5.2%	6.9%	34.5%	51.7%	4.3
16	How likely or unlikely are you to incorporate what you learned at the summer school into the research you will do during the rest of your graduate/post graduate career? (n = 56).....	1.8%	—	5.4%	35.7%	57.1%	4.5
21	How likely or unlikely do you think you are to share the knowledge & skills you learned at the summer school with colleagues at your college/university? (n = 58).....	—	1.7%	12.1%	37.9%	48.3%	4.3
24	How likely or unlikely do you think you are to keep in touch with the community of instructors & students at the summer school? (n = 58).....	3.4%	17.2%	15.5%	43.1%	20.7%	3.6

**Table 1, continued.**

Item	VALUE:	1	2	3	4	5	
	<b>RESPONSE CATEGORY:</b>	<b>No influence at all</b>	<b>A little influence</b>	<b>A moderate amount</b>	<b>A lot of influence</b>	<b>A great deal of influence</b>	<b>MEAN</b>
17	How much influence do you expect the knowledge & skills you learned at the summer school will have on your future career? ( <i>n</i> = 58).....	—	8.6%	39.7%	43.1%	8.6%	3.5
	<b>RESPONSE CATEGORY:</b>	<b>Not at all</b>	<b>To some extent</b>	<b>To a moderate extent</b>	<b>To a large extent</b>	<b>Completely</b>	<b>MEAN</b>
18	As a result of attending the summer school, to what extent were you able to achieve goals that are important to you? ( <i>n</i> = 57) .....	1.8%	7.0%	43.9%	42.1%	5.3%	3.4
	<b>RESPONSE CATEGORY:</b>	<b>Much less likely</b>	<b>Slightly less likely</b>	<b>Neither more nor less likely</b>	<b>Slightly more likely</b>	<b>Much more likely</b>	<b>MEAN</b>
25	As a result of the summer school do you think you are more or less likely to get involved in research that is interdisciplinary? ( <i>n</i> = 57).....	—	1.8%	47.4%	31.6%	19.3%	3.7
	<b>RESPONSE CATEGORY:</b>	<b>Not helpful at all</b>	<b>Slightly helpful</b>	<b>Moderately helpful</b>	<b>Very helpful</b>	<b>Extremely helpful</b>	<b>MEAN</b>
26	How helpful were the teaching assistants (TAs) during the course of the summer school? ( <i>n</i> = 55).....	1.8%	3.6%	12.7%	43.6%	38.2%	4.1
	<b>RESPONSE CATEGORY:</b>	<b>Did not help at all</b>	<b>Helped a little</b>	<b>Made no difference</b>	<b>Helped a lot</b>	<b>Helped a great deal</b>	<b>MEAN</b>
29 <sup>‡</sup>	Compared to not being able to participate at all to what extent did participating remotely help you get the relevant training from the summer school? ( <i>n</i> = 14) .....	—	14.3%	7.1%	50.0%	28.6%	3.9

\* Percentages may not total 100.0% due to rounding.

† Asked only of attending participants.

‡ Asked only of remote participants.

Rather than organize the responses in Table 1 by the order in which they appeared in the questionnaire, we grouped questions with the same response options. Thus, the first five questions on the table use a response scale that ranges from “very poor” to “excellent.” The next two questions use a response scale that ranges from “not useful at all” to “extremely useful,” and so on.

The table includes the total number of respondents answering the question, the percent of the total that selected each response option, and the mean value across all respondents. The mean scores can range from 1 to 5, with values closer to 5 indicating more favorable opinions.

In addition to the 21 questions with ordered responses, the questionnaire included three items that asked respondents to evaluate a specific aspect of the program. One of these included a two-point response option, while the other two included three points. However, in the two-point scale, 100% of respondents chose one category, and the three-point scales are merely categories that are not ordered in a meaningful way. Thus, no mean values are provided. These questions are presented in Table 2.

**Table 2. Responses to Items with Two & Three Response Options**

Item	RESPONSE CATEGORY:	Too few	Too many	Just the right number
5	Was the number of students attending the summer school too many too few or just right? ( <i>n</i> = 57)	7.0%	8.8%	84.2%
	RESPONSE CATEGORY:	Too short	Too long	Just right
6	Was the duration of the summer school too short too long or just right? ( <i>n</i> = 58)	13.8%	10.3%	75.9%
	RESPONSE CATEGORY:	Would not	Would	
2	Would you recommend the summer school on GPUs & Multicores to colleagues or would you not do so? ( <i>n</i> = 58)	—	100.0%	

## Key Findings

### Overall

In general, participants rated the summer school program favorably. The vast majority (84.2%) thought the number of attendees was just right, while 75.9% thought the duration of the program was just right. Overall, 60% rated the summer school program as “excellent,” while 62% rated the instruction as “excellent.” In addition, 100% of the respondents said they would recommend the summer school to their colleagues.

### Application of information

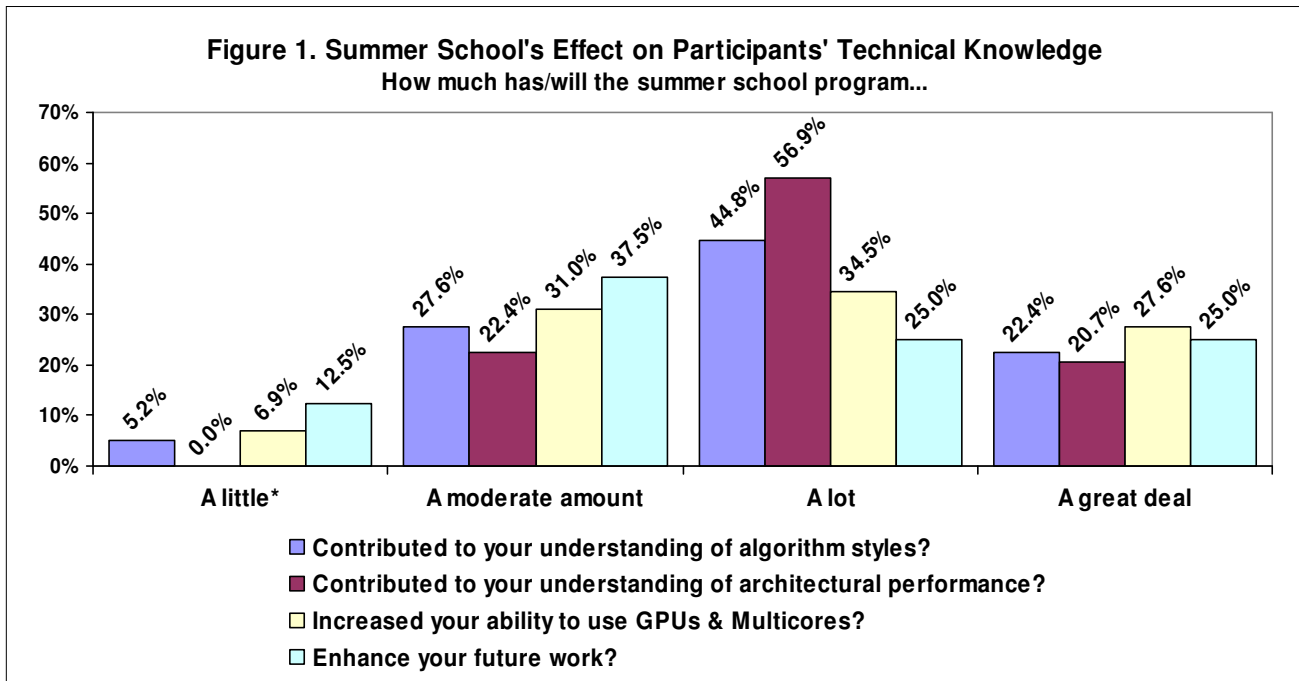
When asked how likely they were to incorporate what they learned at the summer school, 51.7% said they were “extremely likely” to incorporate it into their own work over the next 12 months, 57.1% said they were “extremely likely” to incorporate it into their research over the remainder of their graduate/postgraduate careers, and 48% said they were “extremely likely” to share what they learned with their colleagues.

The 50 respondents who indicated they were somewhat or extremely likely to share knowledge and skills gained at the summer school with colleagues were asked how they plan to share those knowledge and skills. As Table 3 shows, the most mentioned methods included informal discussions, providing information/access to materials/resources to

**Table 3. Way(s) in Which Respondent Will Share Knowledge & Skills Learned at Summer School with Colleagues (Q24)**

METHOD	# of mentions
Informal discussions	11
Providing information/access to materials/resources	8
Teaching/conducting classes	8
Presentations/demonstrations	7
Other ways	12

colleagues, teaching/conducting classes, and presentations/demonstrations. All respondent answers to this open-ended question are available in Appendix E.



\*While the scales in these questions ranged from “not at all” to “a great deal,” none of the respondents chose “not at all” for any of these four questions, so that category is not presented in the graph.

### Technical knowledge

Several questions asked about how the summer school program affected participants’ technical knowledge. Answers to these questions are summarized in Figure 1. In general, most respondents said the program contributed “a lot” to their understanding and abilities.

### Attending and remote participants

While most of questionnaire items were asked of all participants, six questions applied specifically to the logistics of participating either in person or remotely. Two of the questions were asked only of attending participants; four were asked only of remote participants.<sup>1</sup>

Of the 58 summer school participants who responded to the questionnaire, 43 attended in person and 15 participated remotely. Of those who attended in person, 60% rated the training room as “excellent,” while 58% rated the food as “excellent.”

Fourteen remote attendees responded to the questionnaire: two said participating remotely helped “a little” to get the relevant training, one said it made “no difference,” while 11 said it helped “a lot” or “a great deal.” The two respondents who said it helped only a little were asked to select from a list of five reasons all that applied. Poor quality of the video audio feed, limited interaction with other participants, and limited access to TAs were checked by one respondent. Limited interaction with the instructor was checked by both respondents. Neither provided other reasons in the space provided to do so.

When asked how they viewed the session, only two remote participants provided answers. Both viewed it alone, from a campus location, one with a desktop or projector and one with a laptop.

<sup>1</sup> Questions 3 and 4 were asked only of attending participants, while questions 29–32 were asked only of remote participants.

### **Most-liked aspect of summer school**

Forty-nine summer school participants responded to the open-ended item regarding the aspect of summer school they most liked. As Table 4 shows, the quality and/or content of the instruction was mentioned 30 times, and 11 respondents made specific reference to the interactions with other participants. Many referred to multiple aspects as most liked. For example, one respondent wrote

*The food was amazing. The quality of the people participating in this summer school was very, very high. This group of people is on par with the CSGF community, which is considered to be fairly advanced in terms of computational science. Aaron Shinn's talk was very good because it showed lots of code and because the central focus was design decisions.*

Another indicated that

*Topics were quite broad and in depth, probably suitable for both experienced and new people in this area. Hands-on session was helpful to understand what's going on. Application presentations were really nice. Food excellent.*

All 49 responses to this item are listed in Appendix E.

**Table 4. Aspect of Summer School Respondent Liked Most (Q27)**

<b>ASPECT</b>	<b># of mentions</b>
Quality/content of instruction	30
Interactions with other participants	11
Hands-on labs/sessions	9
Multiple things	5
Food	4
Teaching assistants	4
Multi-instructor format	2
Other	7

### **Areas for improvement and other comments**

When presented with the opportunity to suggest areas for improvement and provide other comments, 42 summer school participants did so. As Table 5 shows, 12 mentions were made of content-related issues, including areas that respondents felt needed more or less emphasis. One respondent felt that “[t]here was a bit too much of a focus on NVIDIA products without any mention of alternative options like Rapidmind and Brook+, which are both C++ based,” while another thought it would be helpful “if a small amount of time was devoted to required CUDA run-time libraries and header files that need to be included in a project.”

Other comments related to the summer school’s targeted audience and diversity of participants. One participant indicated that the summer school “Seemed geared towards people who are computer scientists, software or computer engineers who are expanding out into science applications. Not very good for basic scientists that also program.” Another wrote,

*I think it would be beneficial to design the lectures for either students with parallel/computational programming experience or without, but not both. It appeared that some students were bored and others were struggling to catch up – so focusing on one audience or the other may help.*

Responses to this item are available in Appendix E.

**Table 5. Areas for Improvement & Comment Topics (Q28)**

<b>AREA/TOPIC</b>	<b># of mentions</b>
Related to content	12
Related to diversity of participants (computer scientists & others)	7
Related to preparatory/introductory materials	5
Related to case-studies and hands-on sessions	4
Related to remote participation	4
Related to food	3
Other comments	10

## Demographics

The questionnaire included items on the respondents' source of funding for graduate/postgraduate work, age, and race/ethnicity. In addition, the client provided SRL with a file that included data on participants' gender, intended degree, years in program, institution, whether the institution part of the Committee on Institutional Cooperation (CIC), and fellowship receipt. Where the responses do not single out an individual respondent, they are reported below.

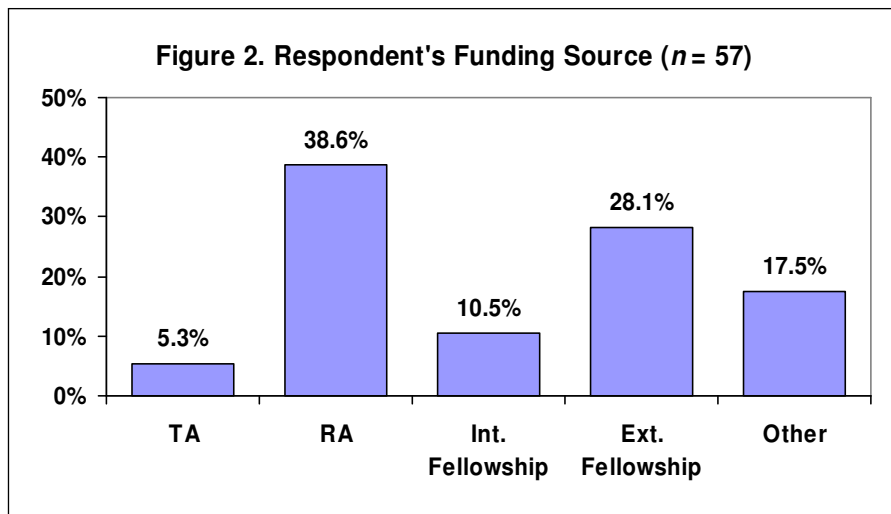
Respondents were asked to provide the source of funding for their graduate or postgraduate work. As Figure 2 indicates, the greatest number of participants (38.6%) is funded by research assistantships. Externally funded fellowships are the next largest source of funds, followed by internal fellowships, other, and teaching assistantships.

Of the 57 respondents who answered the question regarding age, most (52.6%) are between 26 and 30 years of age, while another 28% is older than that and 19% is younger (Table 6).

When asked to indicate race or ethnicity, 64% of respondents said they are White, while 29% said they are Asian.

Other demographic information including gender, whether from a CIC institution, and whether received fellowship was obtained when respondents registered for the summer school. Only 43 respondents provided their gender. Of those, 79% are male and 21% are female. Of the 46 respondents who indicated which degree they are seeking, the vast majority (83.7%) are pursuing a doctorate, while 9.3% are pursuing a master's degree and 7% are pursuing a post-doctorate or professional degree. Equal numbers of respondents ( $n = 8$ ) have been in the program for one year, two years, or three years (Table 7).

Among the 43 respondents for whom we have data, 58.1% attend institutions that are part of the CIC. Of the 40 participants for whom we have data, 52.5% have received a fellowship.



**Table 6. Respondent Age**

In Years	%	#
18 – 20	3.5%	2
21 – 25	15.8	9
26 – 30	52.6	30
31 – 35	17.5	10
36 – 40	7.0	4
41 or older	3.6	2
<b>Total</b>	<b>100.0%</b>	<b>57</b>

**Table 7. Years in Program**

YEARS	%	#
Less than 1	5.0%	2
1	20.0	8
1.5	2.5	1
2	20.0	8
2.5	5.0	2
3	20.0	8
4	17.5	7
4.5	2.5	1
5	7.5	3
<b>Total</b>	<b>100.0%</b>	<b>40</b>

# APPENDIX A

## Questionnaire

### First page of the on-line questionnaire and consent document

#### Welcome to the NCSA Summer School survey!

The National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign, with Dr. Thakkar's assistance, is conducting a survey among participants in the summer school on GPUs and Multicores to seek your feedback on the summer school.

Through this survey, we hope to get information on your experiences at the summer school and its utility to you in your future work and career. While there is no compensation for participating in this study, we value your input and hope that you can devote 10 minutes of your time to answering the questionnaire.

Participation in this survey is voluntary and you are free to stop completing the questionnaire anytime. The decision to participate, decline, or withdraw from participation will have no effect on your status at or future relations with the University of Illinois or your home institution. The information you provide will be completely confidential and will only be reported as group data. There are no known risks associated with participating in this study. Your participation will benefit the hosts and participants in future such workshops by suggesting areas for improvements and for maintenance of quality standards. Aggregated results of the survey will be posted on the summer school Web site and may be shared at professional conferences on similar topics.

To protect the confidentiality of your responses, the Survey Research Laboratory (SRL) at the University of Illinois is managing the administration of this survey. SRL will not provide NCSA with any personal, identifying information.

This survey is being hosted on surveygizmo.com, a popular Web-survey hosting site. This service may have access to the data you submit and your IP number. While we cannot guarantee that this service will keep information you submit confidential, surveygizmo.com has a well-defined privacy policy that clearly states that they will not share information with a third-party. Please refer to surveygizmo.com's privacy policy at <http://www.surveygizmo.com/the-fine-print/> to learn how it collects and uses information.

If you have any questions about this survey, please contact Sowmya Anand at (217) 333 2219 or via e-mail at [sowmya@srl.uiuc.edu](mailto:sowmya@srl.uiuc.edu). You can also contact me; details are below. If you have any concerns about the study or questions about your rights as a research participant, you can contact the Institutional Review Board (IRB) via phone at (217) 333 2670 (you may call collect) or via e-mail at [irb@uiuc.edu](mailto:irb@uiuc.edu).

Thank you for your participation!!

Umesh Thakkar, Ph.D.  
National Center for Supercomputing Applications  
University of Illinois at Urbana-Champaign  
[uthakkar@ncsa.uiuc.edu](mailto:uthakkar@ncsa.uiuc.edu)  
217-333-2095

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I have read and understood the consent document above and voluntarily agree to complete the survey. Click the "print" button on the browser if you would like to print this document for your records.

(Please click on "next page" below to provide consent and to get to the survey.)

1. Overall, how would you rate the summer school on GPUs and Multicores?

- Very poor
- Poor
- Average
- Good
- Excellent

2. Would you recommend the summer school on GPUs and Multicores to colleagues or would you not do so?

- Would recommend
- Would not recommend

**For attending participants only**

3. Overall, how would you rate the training room facility at the summer school?

- Very poor
- Poor
- Average
- Good
- Excellent

4. How would you rate the quality of the meals served during the course of the summer school?

- Very poor
- Poor
- Average
- Good
- Excellent
- NOT APPLICABLE

**For all participants**

5. Was the number of students attending the summer school too many, too few, or just right?

- Too few
- Too many
- Just the right number

6. Was the duration of the summer school too short, too long, or just right?

- Too short**
- Too long**
- Just right**

7. How would you rate the quality of the instruction you received at the summer school?

- Very poor**
- Poor**
- Average**
- Good**
- Excellent**

8. How would you rate the usefulness to you personally of the hands-on sessions at the summer school?

- Not useful at all**
- Slightly useful**
- Moderately useful**
- Very useful**
- Extremely useful**

9. How much has the summer school contributed to advancing your understanding of algorithm styles suitable for accelerators?

- Nothing at all**
- A little**
- A moderate amount**
- A lot**
- A great deal**

10. How much has the summer school contributed to your understanding of architectural performance considerations for developing applications?

- Not at all**
- A little**
- A moderate amount**
- A lot**
- A great deal**

11. How would you rate the quality of the computational training provided by the summer school for accelerating your applications in science and engineering?

- Very poor**
- Poor**

- Average
- Good
- Excellent

12. How much has your ability to use GPUs and Multicores for scientific computing increased as a result of attending the summer school?

- Not increased at all
- Increased a little
- Increased a moderate amount
- Increased a lot
- Increased a great deal

13. How confident are you now that you can write code on your own for GPU or Multicore architecture?

- Not at all confident
- Slightly confident
- Moderately confident
- Very confident
- Extremely confident

14. How useful will the summer school follow-up projects be for your future career?

- Not useful at all
- Slightly useful
- Moderately useful
- Very useful
- Extremely useful

15. How likely or unlikely are you to incorporate what you learned at the summer school into your own work over the next 12 months?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

16. How likely or unlikely are you to incorporate what you learned at the summer school into the research you will do during the rest of your graduate/post-graduate career?

- Extremely unlikely
- Somewhat unlikely

- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

17. How much influence do you expect the knowledge and skills you learned at the summer school will have on your future career?

- No influence at all
- A little influence
- A moderate amount
- A lot of influence
- A great deal of influence

18. As a result of attending the summer school, to what extent were you able to achieve goals that are important to you?

- Not at all
- To some extent
- To a moderate extent
- To a large extent
- Completely

19. From the list below, please select the current source of the funding for your graduate/post-graduate work. **(show/hide trigger question)**

- Teaching assistantship
- Research assistantship
- Fellowship (from within your department / university / college)
- Fellowship (from external source - other than your department / university / college)
- Other

20. How much do you think your experience at the summer school will enhance the work you hope to accomplish as part of your fellowship? **(hidden unless Q9 answer is "Fellowship (from external source - other than your Department/University College))**

- Not at all
- A little
- A moderate amount
- A lot
- A great deal

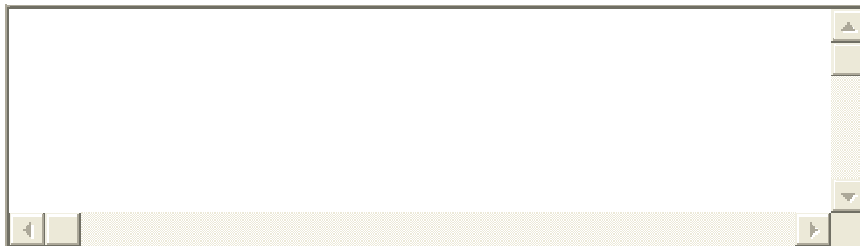
21. How likely or unlikely do you think you are to keep in touch with the community of instructors and students you met at the summer school?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

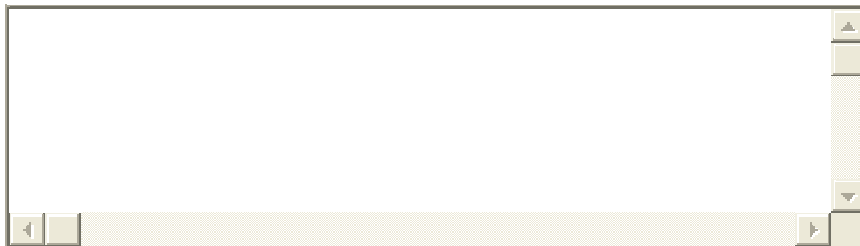
22. How likely or unlikely do you think you are to share the knowledge and skills you learned at the summer school with colleagues at your college / university? **(show/hide trigger question)**

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

23. Why do you think you will not be able to share the knowledge and skills with colleagues at your college / university? **(hidden unless Q22 answer is “Extremely unlikely” or “Somewhat unlikely”)**



24. How do you plan to share the knowledge and skills with colleagues at your college / university? **(hidden unless Q22 answer is “Somewhat likely” or “Extremely likely”)**



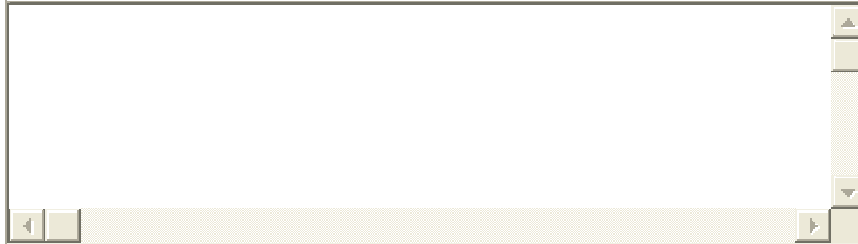
25. As a result of attending the summer school, do you think you are more or less likely to get involved in research that is interdisciplinary?

- Much less likely
- Slightly less likely
- Neither more nor less likely
- Slightly more likely
- Much more likely

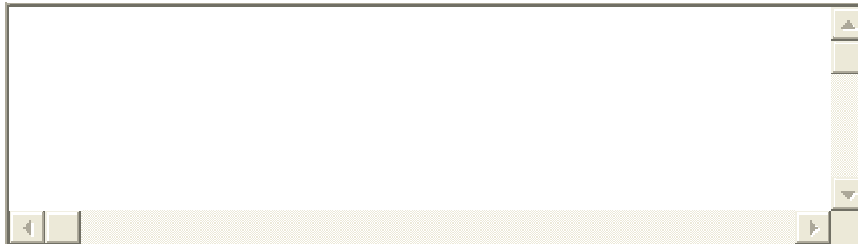
26. How helpful were the teaching assistants (TAs) during the course of the summer school?

- Not helpful at all
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

27. What did you like most about the summer school?



28. Please offer suggestions for improvements or any other comments you might have about the summer school.



**For remote participants only**

29. Compared to not being able to participate at all, to what extent did participating remotely help you get the relevant training from the summer school? **(show/hide trigger question)**

- Did not help at all
- Helped a little
- Made no difference
- Helped a lot
- Helped a great deal

30. Why do you say participating remotely did not help at all?

*Please select all reasons that apply from the list below.  
If a relevant reason is not listed below, please choose "other" and specify.*  
**(hidden unless Q29 answer is "Did not help at all")**

- Poor quality of the video/audio feed from the summer school
- Limitations of local cyber infrastructure

- Limited interaction opportunities with instructor
- Limited interaction opportunities with other participants
- Limited access to teaching assistants
- Other (specify)

31. Why do you say participating remotely helped only a little?

*Please select all reasons that apply from the list below.  
If a relevant reason is not listed below, please choose "other" and specify.  
(hidden unless Q29 answer is "Helped a little")*

- Poor quality of the video/audio feed from the summer school
- Limitations of local cyber infrastructure
- Limited interaction opportunities with instructor
- Limited interaction opportunities with other participants
- Limited access to teaching assistants
- Other (specify)

32. Please describe briefly how you viewed the sessions. Specifically, please tell us whether  
 (i) you viewed it alone or along with others  
 (ii) the type of equipment on which you viewed it (e.g., laptop, desktop etc.), and  
 (iii) the location from which you viewed it (e.g., from home, from classroom at university/college).

Alone or with others?

Type of equipment

Location

**For all participants**

33. Please select the age group to which you belong.

- 18 - 20 years
- 21 - 25 years
- 26 - 30 years
- 31 - 35 years
- 36 - 40 years
- 41 - 45 years
- 46 - 50 years
- More than 50 years

34. Are you Spanish, Hispanic, or Latino/Latina, or are you not?

**Not Spanish/Hispanic/Latino/Latina**

**Spanish/Hispanic/Latino/Latina**

35. What racial or ethnic group or groups best describes you? (*Please select all that apply*)

**American Indian or Alaska Native**

**Asian**

**Black or African American**

**Native Hawaiian or Other Pacific Islander**

**White**

**Other**

**Thank you for giving your feedback!**

## **APPENDIX B**

### **Test E-mail Sent before Survey**

Dear Summer School Participant,

NCSA is conducting a survey to get your feedback on the summer school. More information will be given in the training room on the afternoon of August 21. This initial e-mail is being sent only to verify that e-mails are reaching their intended recipients.

Sincerely,

Sowmya Anand  
Survey Research Laboratory

## APPENDIX C

### Survey Evite

Dear summer school participant,

NCSA is conducting a survey to get your feedback on the summer school on GPUs and Multicores. The survey questionnaire addresses topics such as the effectiveness of the summer school in imparting relevant knowledge, in providing hands-on learning, and in influencing your future work and career. This feedback will help NCSA and other summer school hosts improve or maintain quality standards.

To protect the confidentiality of your responses, the Survey Research Laboratory (SRL) at the University of Illinois is managing the administration of this survey. SRL will not provide NCSA with any personal, identifying information.

If you have any questions about this questionnaire, please contact the SRL investigator, Sowmya Anand, at (217) 333 2219 or via e-mail at [sowmya@srl.uic.edu](mailto:sowmya@srl.uic.edu). If you have any general questions about your rights as a participant in this survey, please contact the University of Illinois Institutional Review Board (IRB) at (217) 333 2670 (you may call collect) or via e-mail at [irb@illinois.edu](mailto:irb@illinois.edu).

Thank you for your participation.

Sincerely,

Umesh Thakkar, Ph.D.  
National Center for Supercomputing Applications  
University of Illinois at Urbana-Champaign  
217-333-2095

## APPENDIX D

### Survey Reminder E-mail

Dear summer school participant,

Last week you might have received an e-mail about a survey that NCSA is conducting to get your feedback on the summer school on GPUs and Multicores. The survey questionnaire addresses topics such as the effectiveness of the summer school in imparting relevant knowledge, in providing hands-on learning, and in influencing your future work and career. This feedback will help NCSA and other summer school hosts improve or maintain quality standards. We would be very grateful if you could help by answering the short on-line questionnaire that will take only 10 minutes of your time.

To protect the confidentiality of your responses, the Survey Research Laboratory (SRL) at the University of Illinois is managing the administration of this survey. SRL will not provide NCSA with any personal, identifying information.

If you have any questions about this questionnaire, please contact the SRL investigator, Sowmya Anand, at (217) 333 2219 or via e-mail at [sowmya@srl.uic.edu](mailto:sowmya@srl.uic.edu). If you have any general questions about your rights as a participant in this survey, please contact the University of Illinois Institutional Review Board (IRB) at (217) 333 2670 (you may call collect) or via e-mail at [irb@illinois.edu](mailto:irb@illinois.edu).

Thank you for your participation.

Sincerely,

Umesh Thakkar, Ph.D.  
National Center for Supercomputing Applications  
University of Illinois at Urbana-Champaign  
217-333-2095

## APPENDIX E

### Responses to Open-Ended Questions

**Q22. Why do you think you will not be able to share the knowledge and skills with colleagues at your college/university?**

- Some already know, others find it for themselves when it is relevant.

**Q23. How do you plan to share the knowledge and skills with colleagues at your college/university? As soon as we obtain the first GPU200s, there will be a number of people who want to make use of it in our group. I will basically assist them in achieving their goals.**

- Ask about GPU resources on campus, speak informally with group and department members about GPUs.
- I plan to give presentations and offer myself as a contact person on campus for CUDA computing.
- At the very least, with informal discussions with my colleagues, but I may make a presentation of what I learned here for my department.
- By making colleagues aware of what is going on in GPU based computing and leading them to available resources on that...
- Discuss with them.
- Discussion and demonstration of codes I plan to write.
- Explaining the lecture notes and other material provided during the summer school
- Face-to-face discussions & e-mails to friends doing similar things that could incorporate GPU technology.
- Forward the materials to my research students.
- Helping those learning the technology, evangelizing, influencing purchasing (we need a GTX280 machine!!!),
- I am certain to at the least share the knowledge with my research lab in the form of 1 or 2 1-hour presentations. I'm considering approaching some instructor about doing 2 to 3 class sessions on the CUDA programming model (perhaps in the parallel algorithms course).
- I am going to encourage the CS department to create a class or sub-class on CUDA next year. Given that, to the best of my knowledge, I am the only person at my university who knows CUDA, I will probably be teaching a good portion of the material should such a course exist.
- I expect to eventually be put in charge of the purchase and development of a GPU cluster for my department, and be expected to guide/teach my fellow students in the basics of GPUs and the conversion of their code.
- I imagine I might provide individual instruction to other students. Possibly might put together graduate student level seminar of instruction. It will take a deeper level of immersion before I would be competent to act as TA in a CUDA course.
- I will be presenting this information to my research group. Other members have already expressed interest in GPU programming.
- I will discuss ideas of possible problems for which the GPU will be useful with my advisor and other computationally focused cosmologists.
- I will share this knowledge & skills with my adviser & my classmates in our department. Hopefully it can make our computation improved.
- I will show the result from my own code on GPU. I believe none will refuse really good things.
- I will talk about applications of computation on GPUs with my colleges so that we may apply the knowledge I've learn at the summer school for the current ongoing project or data analysis we have, but couldn't analyze because of computation time.
- I would like to give presentations regarding the potential of GPUs for scientific computations.
- I would like to have the time to offer a course. I am presently thinking of requesting a course addition for the spring. But in contact with my colleagues, we may find a more useful vector for a teaching/learning environment (perhaps weekly seminars through the fall, perhaps large once a month talks with more one on one interaction afterward? not sure.
- Tell other people doing computational research that GPUs are being added to our cluster and give them an idea of what they are most effective for. Try to adapt code being written by collaborators to either GPUs or multicore systems.
- Incorporating some of this work into my teaching
- Through seminars/talks about my own work.
- Most likely through informal discussions with colleagues.

- My fellowship is part of an IGERT on computational fluid dynamics. Part of the support to attend this conference relied on me proposing to use the material I learn here to advance my research & help educate the other interdisciplinary graduate students in my group. I plan to incorporate what I learned in our biweekly informal student meetings on computational methods. We are also in the process of starting a student organization at our university that spans all computational science & some type of GPU discussion or meetings would be a great idea.
- My lab mates & I will be trying our application on this platform. From the experience acquired during this summer school, somehow I will be able to either guide them on porting the simulations or at least point them to existing resources. But the most important in my point of view is to maintain a fluid communication with the group (instructors, TAs, researchers, etc.) offering the Virtual School. On the other hand, when future editions of the School are announced, I will be strongly recommending it to my fellow students & colleagues. I believe that having all the course material available is of tremendous help for foreign communities. It also allows me to refer my colleagues at my home country to the material &, hopefully, increase their awareness to this topic.
- Overview of the program; sharing of slides and code samples
- Port some of my Matlab codes into CUDA and test for improved performance. Then other students in my group can use the CUDA versions and try to improve and develop them further, hopefully leading to future collaborative projects based on CUDA.
- We have an incredibly small group of GPU programmers at UCT, any tips I have received at this workshop that will help others will be passed on. I am also going to take all the videos home with me for this reason. Thanks
- Through informal discussion and sharing of course materials.
- Refer fellow researchers to the video broadcasts saved on your Web site. Shared development of functions using GPU processing.
- Suggest teaching CUDA (along with MPI) to my advisor who teaches a class in Parallel Programming.
- Talk about it informally, as well as give short tutorials once I develop sufficient mastery over the application of GPUs in my own field.
- There are several projects [needing] the high performance GPU to improve their performance, I will work with my colleagues to make their current work run with a good performance on GPU and will help them to know how to build their further things during the process.
- There are various HPC projects and trainings in TACC, and I am still closely connected with my collaborators in theoretical and computational nuclear physics. I would like explain to them how some of our computations are fitted to the features and potentials offered by GPU.
- This week I have been porting a portion my current research code to GPUs. Once completed, the new code will speed up my research and many others. In addition, I will perform some evangelism once I get home.
- Through on-line discussion forums and communication to NSCA/UIUC by e-mail
- Personal conversations, maybe training in small groups
- Will present material on GPUs & my experiences in CS classes such as nontraditional architectures. Will also participate in BOF sessions on this topic in hpc-oriented & scientific domain oriented conferences & workshops. Also intend to publish work on application of GPUs to scientific applications.
- working on GPU programming for scientific applications.

## Q27. What did you like most about the summer school?

- I really liked the hands-on sessions because I learn best by doing. These sessions reinforced the concepts learned in lectures.
- As a remote participant, I found that the discussion board was very helpful. But also the on-line availability of the slides and of course the video stream was very important. I also liked the not so crowded agenda, which made the week not only productive but also enjoyable. Last but not least the hands-on problems contributed much to my confidence to apply my knowledge about GPU programming to my own research problems.
- Balance between presentations and labs
  - Diversity of students
  - Case studies were very useful
  - Staff very personable
  - Appreciated the analogies used throughout the presentations

- Being part of a community of like-minded and similar-interested individuals
- Comfortable congenial atmosphere encouraged interaction with instructors during lectures & also with students. It was a privilege to have Wen-mei & David as our main lecturers for so many days. They must both be very busy & the fact that they dedicated a whole week of the class (& all the preparation) is truly appreciated. Good opportunities to network with other students & researchers. The guest lectures were very relevant, interesting, & engaging. Umesh & the rest of the team were terrific & keeping things operating. Great job. The food was also wonderful. You spoiled us.
- Enough time during the week (after hours) to be able to go out for beers and talk to people. The feedback session was good, I think.
- Explain of the GPU programming from different angles.
- Focus on advanced optimization, John Stone's presentation...everything but the basic overview on the first few days ;-)
- Good breadth of data.
- Good pacing of courses (with plenty of food), hands-on labs to illustrate concepts, location convenient to hotel
- Hands-on labs and getting to experience coding in CUDA on the spot. The labs were really well prepared and the TAs were exceedingly helpful. I learned enough from the labs to get me started in converting my own codes to CUDA.
- I enjoyed the broad overview & introduction into key concepts of CUDA & GPU programming as well as the chance to interact with both other students that are learning & TAs to bounce ideas off of.
- I like the lectures and hands-on lab a lot. Because I have learned a lot of great experiments from those.
- I liked the basic information on using GPUs, as well as Dr. Kirk's keynote speech.
- I thought the explanations of the architectural details and performance considerations were excellent. I also appreciated the face-to-face contact with other graduate students.
- Lectures/lab session
- I liked the multiple instructor format. I thought that the keynotes were all very good and interesting. I found the most interesting keynote to be the Microsoft one, probably because he discussed algorithms.
- I most liked the discussion of basic CUDA API calls and the NVIDIA architecture.
- I thought it was well structured. We heard from the technology developers. We heard from the computer scientists. And, eventually, we heard from individuals who had actually had to port their codes into the GPU paradigm.
- I thought the introductory lectures were very good as they quickly brought me to a point where I could write basic code to run on the GPU.
- Immersion in GPU education. It helped me focus on the subject matter, learn about similar problems other people face in very different fields, and I got a great background on not just GPU computing, but high performance computing in general.
- Interaction with students in different domains has given me a much better idea on what some of the current computational demands are for each discipline. This is something you don't get by attending field-specific conferences for instance. The opportunity to interact with the TAs and instructors and get opinions on how to thread your own apps is also invaluable.
- It was nice and organized and had people from multidisciplinary teams
- learn something I never touched, some of my experiences in HPC are still applicable in this new hardware, but some others, such as memory management based performance programming is a kind of new to me. resonance with other participants is great, they gave me help to many aspect, like how to setup CUDA on my laptop so that I can continue my effort after the school. Question & Answer in school sessions were also very good, many of those broaden my horizon.
- Learn the CUDA API. It is well designed and easy to use. I am excited about upcoming versions of CUDA.
- Materials were pertinent and presented well
- Lots of things: -Good mix of technical and conceptual information -Very knowledgeable lecturers -Good real-world examples -Very interesting mix of attendees with varied backgrounds -Excellent food & general hospitality
- The networking time with other students at meals was very good.
- The lectures from Professor Hwu and Dr. Kirk, and the TA's hard work!
- Simply the information it contained
- The instructors' enthusiasm.
- That the program was reasonably short and focused, and that it included hands-on labs. The hands-on labs were invaluable for testing understanding of the concepts discussed.

- The chance to physically get away from my own university and completely focus on learning about a new topic that can benefit my research in the long term.
- The detailed case studies presentation and especially the one given on Friday morning
- The fact that its quality was very high and on top of that it was free. Moreover, the effort of the instructors & organizers to help the participants, and to promote GPU supercomputing is extraordinary and it is highly appreciated.
- The fact that students not admitted to the program can still take part in the program on-line. I think this is so innovative and should perhaps be practiced in other summer schools too.
- The food was amazing. The quality of the people participating in this summer school was very, very high. This group of people is on par with the CSGF community, which is considered to be fairly advanced in terms of computational science. Aaron Shinn's talk was very good because it showed lots of code and because the central focus was design decisions.
- There are many aspects. First of all, friendliness & openness of instructors, researchers, & organizers. Usually, people keep research topics somehow confidential until they have been widely published. I feel it's not the case here, where we have been shown cutting edge research & applications on this relatively new platform.
- The presentations are kept for future reference and referral. The summer school got to the level of coding, not just discussion of algorithms.
- the topic
- The speakers were all experts in their field, & the mix of students provided a great diversity of views.
- The instruction was excellent. The one-on-one sessions were very useful – allowing another opportunity to ask one-on-one questions that came up as we crashed through development.
- The instructors (Wen-Mei Hwu and David Kirk) were fantastic, as was TA John Stratton. The hands-on labs were helpful for giving the information a more concrete context. The case study presentations were very helpful for understanding the types of problems that GPU programming can be applied to.
- The primary instructors (Drs. Hwu and Kirk) were both outstanding. I felt very fortunate to learn from them as it was obvious that they have intricate knowledge of the hardware, tool chain, required skills, and potential issues associated with high performance CUDA-based computing.
- The programming case study, to see the evolution of the code with different performance. And also with my research perspective, I value the domain science talk very much. To see how the most successful code is writing, gives me most direct and manageable knowledge on coding.
- This was a great way to get into GPU programming; I always intended to do it. This course will have definitely reduced the length of the learning curve. I also liked the highly technical talks, but that's because I'm from a computer science background.
- The quality of instruction was really very good.
- The hands-on labs
- Topics were quite broad and in depth, probably suitable for both experienced and new people in this area. Hands-on session was helpful to understand what's going on. Application presentations were really nice. Food excellent.

**Q28. Please offer suggestions for improvements or any other comments you might have about the summer school.**

- Hands-on session maybe too small. If you could squeeze in more practice sessions rather than case studies we could feel more comfortable with coding our own code.
- A 3-word description of research interest on everyone's nametags.
- Bring us this kind of new technology and new development in future, just like this!
- As a domain scientist, I found the early talks to be too heavily focused on architecture for my understanding. I would have liked to have the case study presentations interspersed throughout the week, so that on day one I may have gained an idea of how scientists like me are using GPUs to solve their problems. Also, it would be nice to start in on hands-on labs earlier (the first day) to help solidify ideas and take them from the abstract to a concrete implementation. It would be interesting to have more options of problems for the lab time, and perhaps different types of labs depending on one's background (computer science vs. not computer science, for example).
- More case-study examples where the design considerations are emphasized. -Would have liked more information about texture memory.

-Not sure how biased the content/comments were towards NVIDIA.

- Offer some tutorials before the beginning of the summer school that we can prepare a little. 2. The TA or the Professors can explain a little bit more about the hands-on lab after we finish the lab to clarify the provided solutions.
- As a mechanical engineer who only codes when he has to, an introduction to the basic operation of a GPU-CPU computer would be invaluable. Defining terms like threads, warp, cache, kernel and explaining how the various computer components communicate with a simple analogy would be perfect.
- As a remote student, it is extremely important to have the presentation slides on the agenda before the lecture starts. It would be nice to use platform independent video broadcasting software; because Windows Media Player is required, a Windows operating system is also required. I use Linux exclusively, so I had to borrow a computer. The TAs need the ability to post documents to the forums.
- food :)
- For GPU, maybe the next practical thing is whether we have a GPU card in our machine to run. I am not saying free shipping GPU card, but instructions on how to configure the GPU hardware and software environment. As true science computation, I need useful scale of the GPUs to do the job within acceptable computational time.
- For remote participation it was crucial to have the speaker's slides available for download before the talk. It would also be useful to have the presenter's screen videotaped. The instructors were excellent, in general, although I think Hwu may have attempted to simplify things too much so that some of his explanations were difficult to understand by someone who has already done GPU programming. Perhaps this is inevitable.
- I stand by my suggestion of an advanced workshop to cover things like bank conflicts, profiling, vector warp programming, etc. I think there was a very good mix of applications/examples and lectures/training.
- I think the projects thing is kind of twee & juvenile. Obviously the first group has taken to it well, but it created a lot of confusion among the students. What we were supposed to do was not at all clear, nor at what level. I think the receptions should be slightly better supplied, or not have them at all. The last night's reception ended up as hors

d'oeuvres that were gone immediately & cold pizza from the night before. It would have been far better to not have had it, or maybe had drinks but not food, or perhaps organize a trip [to] a local restaurant (Jupiters? Jillians's? Biaggi's)? It's a tribute to the strength of the feeling of community that despite no food, there were people here talking long after the reception was officially closed. I think it's very important for future classes to be very clear about the level of competence that is expected for the programming. There were a lot of people in this class who were lost. People to whom, for instance, what a cache is only a vague concept. The idea that everyone is expected to bring a laptop should be stated EXPLICITLY, probably with the class requirements & re-stated in the class travel information. A purely social issue is to have someone with a loud, clear voice do the beginning & ending sessions announcements. At the beginning of the feedback session, Wen-mei said something about a 10-minute break, then walked back through the room. Then the woman in charge of the feedback (with a very soft voice) stood up and tried to talk to the room. The students weren't being rude, most of them thought that a break had been called.

- I think the project aspect of the course is of little use. However, it was nice to talk to others from other disciplines about how they might use GPU technology.
- I would have rather had more intensive sessions on performance, etc. (add back in some of the material removed from the semester course) at the expense of some case studies. I think with a list of applicable library calls (a cheat sheet), the labs would be more interesting if we were expected to create at least one CUDA program from scratch. Even a more extensive tutorial sheet, or be given a pseudo code that we then had to implement. Of course, I could do that in 2-3 hours (go from nothing to a working code), but many probably could not.
- Include a poster session for the students to present their on-going research work
- It was very, very good. I would love to see a 2.0 version of this class covering texturing, asynchronous/stream/overlapping execution, multi GPUs per node(s), more coverage of Shane Ryoo's work, (optimization space pruning and performance characteristics).
- It would be useful to have another lecture between lecture 4 & 5. I felt there was a large jump in difficulty when we moved to optimizations & I was

still trying to understand the ideas we learned on day 2. I would have liked another lecture that lived between these two. I think this could be accomplished with one less keynote & one more lecture.

- It would have been helpful if a small amount of time was devoted to required CUDA run-time libraries and header files that need to be included in a project. I am sure this is documented somewhere (or can be found in the lab projects), but a single reference slide would be helpful when starting out a new project.
- Lunches & reception food were amazing, but I would have really appreciated some source of protein at breakfast. I also wish I'd had a better idea of both the assumed knowledge coming into the course & the specific subject matter before arriving.
- More healthy food options would have been appreciated.
- More prep material could be available before the workshop
- Most of the material was spot-on; I think the curriculum would not have suffered from removing the session on the IEEE floating point standard. A week is probably a little long but I wouldn't recommend shortening it by more than a day or two.
- My suggestions are to try to offer the same material on a frequent basis, as well as try to evolve it for the ones that have already taken it. The other suggestion I made before is to keep posting all the material on-line. I'm pretty sure it is going to be tremendously useful to research communities outside the US, where the resources for cutting-edge research are practically nonexistent. Another important step forward would be to offer access to computational resources to those research communities. The cost of doing that I'm guessing is practically null, and there's also reasonably decent Internet infrastructure in undeveloped countries to at least give reasonable text mode access to the resources.
- Nearly no basic programming development for GPU. Seemed geared towards people who are computer scientists, software or computer engineers who are expanding out into science applications. Not very good for basic scientists that also program. No substantive workshop development of CUDA use and implementation. The workshop was geared towards optimizations and community development. This workshop should be broken up into two: a programming and optimizations class for CUDA and a separate community development conference
- On-line documentation & video formats available to OS systems, maybe something on YouTube or Google video.
- Provide microphones for questions from students during lectures. Explain texture memory and its advantages in more detail.
- Really improving the hands-on lab sessions. Perhaps a slightly longer course – as I see it, GPU programming is really an art at this point, and it would have been very helpful to have sessions about actual coding issues/ implementation tips.
- Room was a little dark for computer use/reading, a text CUDA handbook could be included in the participant materials (keywords, programming structure, compilation flags), more information about other participants (research interests) available before or at beginning of workshop, dedicated workshop brainstorming time for group projects
- Some things that could be improved are: - There was a bit too much of a focus on NVIDIA products without any mention of alternative options like Rapidmind and Brook+, which are both C++ based - Some of the terminology used was inconsistent with their traditional use (e.g., global, local, shared memory) so a reference guide would be useful
- Sometimes the discussions were too technical for the non-computer scientists. Often the questions disrupted the flow of the lectures and caused the instructors to go off on loosely related tangents. It would be helpful if we were provided with a glossary of basic (e.g., registers, core, etc.) computer science terminology. I have some idea what the different terms mean, but a more precise definition would be useful.
- The experience of the students was quite diverse. I think it would be beneficial to design the lectures for either students with parallel/computational programming experience or without, but not both. It appeared that some students were bored and others were struggling to catch up – so focusing on one audience or the other may help. It would have been nice at the beginning to have a bio, research interests, and reason for coming to the summer school of each student. Several students had overlapping interests, and this would help foster conversation and brain storming on applying GPUs to common problems in each discipline.
- This has been discussed in the discussion board, but I just want to repeat that the camera could have

been pointed to both the speaker as well as the slides. The slides were recognizable (you also have the printouts after all), and you actually had a chance to see where the speaker is pointing to.

- The GPU application talks were not incredibly useful for understanding how & why to apply GPUs to basic problems. It may be useful to have more (and briefer) hands-on labs where problems other than just matrix multiplication are considered.
- The participants in the school had a very wide background – a few students were entirely new to parallel programming, while many had a strong background or at least some experience in developing parallel algorithms for the message passing paradigm. There is a need to bridge the two & both address how a parallel algorithm is developed from the data division & identification of the fine grain parallel parts, & relating data-parallel algorithms that are appropriate for CUDA/ GPUs to the more traditional linear algebra algorithms that are appropriate for message passing. ALSO!!! the name GPUs & MULTICORES is VERY misleading!!! There was no real attempt to address any aspect that is specific to multicore CPUs other than a mere mention of the possibility that CUDA can also compile to CPUs with a modest improvement of performance. This is NOT equivalent to parallelizing a code for a many-core CPU shared-memory machine!
- The summer school is great, but I felt that at times it may have been too technical for non computer scientists, I have always done CS, so I understood the terms and concepts, may others didn't and had to ask after the lecture what a concept meant, and that's too late. E.g.: I was asked by another student what caching was and how it worked on CPUs. And I think that if you understood the concept of CPU caching, the lectures were easy to follow, but if you didn't it was hard. You need to explain each concept broadly with out reference to a GPU first so that its inherently more understandable to those who haven't encountered it before
- There was not enough lab time to work on the project. The time given was not sufficient to accomplish anything in terms of writing code, and despite spending all my free time on this, I was not able to make as much progress as I would have liked. Also, the TAs are not available at 11 PM to help me, so working outside of the summer school is not as valuable. Since there is not much to do in UIUC at night, consider extending sessions to the evening. More TAs, perhaps alumni of this summer school, would be good. I didn't come here to learn about MRI, for example, so other talks were less useful, despite their high quality by general standards. This suggestion has already begun to be implemented, which shows how well the School adapted our students' needs and wants. I can speak enough to that. I would have like the labs to focus on a range of applications other than matrix multiply. While it was great & helped me understand CUDA and some techniques that will work on other projects I'm working on, I felt they were more focused on computer science techniques (e.g., calculating indexes). While this is definitely important to our learning how to implement CUDA, its lacks more broad look at solving problems. The case studies began to show students application that were at a better level of understanding how to apply CUDA from a domain side. I learned a lot by seeing the sample codes in the case studies and even more with the added CFD talk by Aaron Shim. If the hands-on labs included implementing all or parts of things like this, I would have felt a closer tie to my research even though it's not exactly the method I use.
- Those of us viewing remotely from EVL/UIC would have benefited from the instructors actually running code during the lectures to see various speedups etc. It would have also helped if the slides were available before the lecture started. In the first days talks there were some questions that were not repeated for the remote audience
- There was a lot material that was considered too advanced to cover in this introductory school. I would love a guide to those more advanced topics so that I can learn them when they become useful to me and my project.
- Timely availability of slides or broadcasting slides on the video screen of ALL talks is a must for remote participants.
- To me it is a great school