

Teaching Computer Graphics in Brazil

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Abstract. We present in this panel a collection of views and experiences about computer graphics teaching and education in Brazil. We hope this discussion will further development of guidelines and teaching materials for computer graphics curricula and courses.

1 Introduction

The activities related with Computer Graphics Teaching in Brazil have received relatively little attention and discussion from the Computer Graphics Academic Community. On one hand we have a strong research community mature enough to deserve international recognition [8]. On the other hand it seems we are not paying enough attention to discuss issues related with teaching computer graphics, in spite of individual efforts [1].

This panel aims to be a forum for discussions on various issues related with Computer Graphics Teaching in Brazil. In general terms the main goals of this panel are:

- To discuss the syllabi for introductory computer science graphics courses
- To identify a set of most-commonly taught concepts in introductory courses.
- To assess the impact of OpenGL in teaching computer graphics concepts.
- To encourage the submission of papers, panels, workshops on issues of interest to computer science graphics educators in Brazil.

Below we list the main topics which are going to be addressed by the members of the panel.

2 Undergraduate versus Graduate Syllabi

Computer Graphics in Brazil has seen a great development since the first courses appeared in late 80's (the first SIB-GRAPI was held in 1987). Initially the courses were taught only at the Graduate level. Gradually, the educational institutions started to adapt their curricula to include computer graphics courses as a mandatory subject for every undergraduate in Computer Science. What should be the scope of each level? As the field matures many topics which

were usually only covered at the graduate level are also now covered at the undergraduate level, leaving the instructor with the hard task of selecting suitable topics for each level. What should be covered at both undergraduate and graduate levels?

3 Suggested Syllabus by the Brazilian Computer Society

There is an ongoing discussion sponsored by the Brazilian Computer Society to propose a reference curriculum for Computer Science courses in Brazil. This suggestion lists a required course in Computer Graphics. What do we have to say about this course? Is the description complete? Which topics should be covered? In what depth? What is the standard software and hardware environment that we should have in our labs? The SIGGRAPH Educational Committee is also addressing these issues in North American Schools. For instance see [6, 4].

4 Textbooks

In general, the field of Computer Science does not have many available good textbooks in Portuguese for undergraduate courses. As a result the instructors are faced with the dilemma of how to make the literature more available to their students. Invariably the possibilities are two, either to use personal notes written by the teachers themselves or to use literature in English. What does that mean? Of course it does not mean that we are not capable of writing good textbooks in Portuguese as the exceptional efforts by Gomes and Velho so evidently show [2, 3]. As a community should we concentrate our efforts on translations of well-known books or stimulate original books in Portuguese?

5 Basics versus Application-Oriented

In some fields Computer Graphics is approached as a tool and not as a discipline on its own. Fields such as Architecture, Engineering, Visual Arts and others use sophisticated graphics applications (e.g. Photoshop) which demand knowledge of basic computer graphics concepts but do not require their students to ever write a graphics application. How do we approach these cases, i.e., how to turn a student of a field which is not computer science into a computer graphics *literate* person.

6 OpenGL

The advent of standard computer graphics high-level software library such as OpenGL [7] has introduced new possibilities for computer graphics educators [5]. OpenGL provides routines to carry out many of the basics tasks required in graphics applications. The instructors now have the possibility of focussing their courses on more advanced topics such as illumination models, geometric modeling and animation, and spend less time teaching basic 2D algorithms such as line-clipping and raster algorithms. Where should we draw the line?

References

- [1] Thomas Buck. Uma experiência no ensino de computação gráfica. In *SIBGRAPI'97 (CDROM)*, October 1997.
- [2] J. Gomes and L. Velho. *Computação Gráfica: Imagem*. Sociedade Brasileira de Matemática, 1994.
- [3] J. Gomes and L. Velho. *Computação Gráfica - Volume 1*. Sociedade Brasileira de Matemática, 1998.
- [4] R. Wolfe, S. Cunningham, S. Grissom, and L. Hitchner. New possibilities in the introductory graphics course for computer science majors. *Computer Graphics*, 33(2):35–39, May 1999.
- [5] Rosalee Wolfe. Opengl: Agent of change or sign of the times? *Computer Graphics*, 32(4):29–31, November 1998.
- [6] Rosalee Wolfe. A syllabus survey: Examining the state of current practice in introductory computer graphics courses. *Computer Graphics*, 33(1):32–33, February 1999.
- [7] Mason Woo. *OpenGL Programming Guide*. Addison-Wesley, 1998.
- [8] Marcelo K. Zuffo. Brazil: A well established academic community and a fast emerging market. *Computer Graphics*, 30(2):8–10, May 1996.