

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: McFarland et al.
U.S. Patent No.: 5,959,633 Attorney Docket No.: 19473-0309IP1
Issue Date: Sep. 28, 1999
Appl. Serial No.: 08/726,091
Filing Date: Oct. 4, 1996
Title: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

DECLARATION OF DR. ANSELMO LASTRA

I, Dr. Anselmo Lastra, of Chapel Hill, NC, declare that:

QUALIFICATIONS AND BACKGROUND INFORMATION

1. I have been a professor in the Department of Computer Science at the University of North Carolina at Chapel Hill since 1991. I am currently a tenured Professor and Chairman of the Computer Science Department. My qualifications for formulating my analysis on this matter are summarized here and are addressed more fully in my curriculum vitae, which is attached hereto as Appendix A.

2. I received my Bachelor of Science degree in Electrical Engineering from the Georgia Institute of Technology in 1972. In 1981, I received a Master of Arts degree in Computer Science from Duke University. In 1988, I received a Ph.D. in Computer Science from Duke University.

3. Since 1972 I have been involved in the research, development, and design of hardware and software for computer systems, including computer graphics systems.

4. From 1972 to 1975, I was an engineer at Scidata Inc. in New York, New York and Miami, Florida. From 1975 to 1979, I was an engineer and then project manager at

Coulter Electronics in Miami, Florida. While holding these positions, I designed electronic hardware, software, and medical instruments and for a time I supervised a team of engineers and technicians.

5. From 1988 to 1991, I was a Research Assistant Professor at Duke University in Durham, North Carolina. While holding this position, I taught computer science classes and performed research in the areas of parallel processing and performance, and computational science, with a particular interest in graphics and pattern recognition.

6. In 1991, I joined the Computer Science Department at the University of North Carolina at Chapel Hill as a Research Assistant Professor. In 2001, I was promoted to Associate Professor. In 2006, I was promoted to full Professor, and since 2009 I have served as Chairman of the Computer Science Department.

7. At the University of North Carolina at Chapel Hill, I worked on the Pixel-Planes and PixelFlow projects. With support from the National Science Foundation and the Defense Advanced Research Projects Agency, we developed a heterogeneous graphics supercomputer called Pixel-Planes 5 that was, to the best of my knowledge, the fastest of its time. We later developed another heterogeneous graphics supercomputer called PixelFlow.

8. At the University of North Carolina at Chapel Hill, I have taught courses in computer graphics, graphics hardware, computer architecture, 3D computer animation, image generation, robotics, digital logic, programming, and other subjects.

9. I have authored or co-authored over 80 research papers and articles, many of which relate to computer graphics and were presented in prestigious venues, such as the annual conference of the Association for Computing Machinery's Special Interest Group on Computer Graphics and Interactive Techniques ("SIGGRAPH"). A complete list of my publications is contained in my curriculum vitae in Appendix A.

10. I co-authored perhaps the first publication in the area now known as General Purpose Computing on Graphics Processors ("GPGPU"): Harris, Coombe, Scheuermann, and Lastra, "Physically-Based Visual Simulation on Graphics Hardware," Graphics Hardware 2002, 109-118. With two colleagues from the University of North Carolina at Chapel Hill, I organized the 2004 Workshop on GPGPU held in Los Angeles, which brought this technology to a wider audience.

11. I served a term on the editorial board of the IEEE Transactions on Visualization and Computer Graphics. I also served a term on the editorial board of IEEE Computer Graphics and Applications. I was on the SIGGRAPH conference organization committee. I served as papers chair, program chair, treasurer and general chair of the Graphics Hardware conference, and I also served on the advisory board. In 2009, we merged Graphics Hardware with the Symposium on Interactive Ray Tracing and created the High Performance Graphics Conference. I currently serve on the steering committee.

12. Based on my above-described 40 years of experience in computer system design and graphics hardware and software, I believe that I am considered to be an expert in computer graphics.

13. In writing this Declaration, I have considered the following: my own knowledge and experience, including my work experience in the fields of computer science, computer engineering, and computer graphics systems; my experience in teaching those subjects; and my experience in working with others involved in those fields. In addition, I have analyzed the following publications and materials:

- The disclosure and claims of U.S. Patent No. 5,959,633 (“the ‘633 patent”);
- The prosecution history of the ‘633 patent;
- U.S. Patent No. 5,883,639 to Walton et al. (“Walton”);
- U.S. Patent No. 5,564,048 to Eick et al. (“Eick”); and
- *Inside Visual C++, Second Edition: Version 1.5* by David J. Kruglinski, September 1, 1994 (“Kruglinski”)
- The additional references and background materials specifically identified below in this Expert Declaration, which are attached as Appendices A-C.

14. Although for the sake of brevity this Declaration refers to selected portions of the cited references, it should be understood that one of ordinary skill in the art would view the references cited herein in their entirety, and in combination with other references cited

herein or cited within the references themselves. The references used in this Declaration, therefore, should be viewed as being incorporated herein in their entirety.

15. I am not, and never was, an employee of Google Inc., Samsung Telecommunications America, LLC, Samsung Electronics America, Inc., or Samsung Electronics Col., Ltd. I have been engaged in the present matter to provide my independent analysis of the issues raised in the petition for *inter partes* review of the '633 patent. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent studying the matter, and I will not receive any added compensation based on the outcome of this *inter partes* review of the '633 patent.

OVERVIEW OF CONCLUSIONS FORMED

16. This expert Declaration explains the conclusions that I have formed based on my analysis. To summarize those conclusions:

- Based upon my knowledge and experience and my review of the prior art publications listed above, I believe that claims 1-4, 6, 8-11, 13, and 15 of the '633 patent are anticipated by U.S. Patent No. 5,883,639 ("Walton").
- Based upon my knowledge and experience in this art and my review of the prior art publications listed above, I believe that claims 1-4, 6, 8-11, 13, and 15 of the '633 patent are rendered obvious in light of U.S. Patent No. 5,564, 048 ("Eick") in view of *Inside Visual C++, Second Edition: Version 1.5* by David J. Kruglinski, September 1, 1994 ("Kruglinski").

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