

**THE COMPUTER GRAPHICS INTERFACE -
THE NEXT INTERNATIONAL GRAPHICS
STANDARD**

COURSE # 25

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The Computer Graphics Interface

The Next International Graphics Standard

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ABSTRACT

The Computer Graphics Interface (CGI) provides a device-independent foundation level standard to which computer graphics devices can be designed and interfaced and upon which other graphics standards, packages, and systems can be implemented. The CGI is expected to advance to Draft International Standard status the end of 1989.

This course explains the constituency and purpose of the CGI standard. Embedded in this explanation is an overview of the structure of the CGI and its relationship to other graphics standards, including GKS, PHIGS, and CGM. The procedural bindings and data encodings of the CGI are reviewed. A reference model of the CGI showing various configurations in which the CGI can occur is presented. The use of the CGI as a system level interface and its relationship to window management systems is described. Particular emphasis is placed on the constituency profiles, the pipeline model, graphic objects, compound primitives, and support for raster operations.

BIOGRAPHIES

Janet S. Chin is the principal consultant and president of Chin Associates specializing in computer graphics education, product planning, and design. She was the International Representative of the ANSI Accredited Standards Committee (ASC) technical committee responsible for computer graphics standards from 1982 through 1988. She was the Vice Chairperson of that committee from 1979 through 1982. She has been an active participant in the ISO and ANSI groups responsible for developing the CGI. Janet has developed and presented a number of seminars and tutorials on GKS, CGI, and computer graphics.

Theodore N. Reed is a staff member at Los Alamos National Laboratory responsible for computer graphics planning and advanced development activities. He was the Chairman of the ASC task group responsible for the CGM and CGI standards from their inception in 1979 until 1984. He has since been an active participant in the ISO and ANSI groups responsible for developing the CGI. Ted has been active in the computer graphics field for 19 years and has presented numerous papers in the United States and Europe.

Karla S. Chauveau is the Vice President of Engineering at Metheus Corporation responsible for all high resolution graphics engineering and product marketing activities. Her background is in graphics software engineering and marketing; her particular area of expertise is computer graphics. Karla has been the Chairperson of the ASC task group responsible for the CGM and CGI standards since 1985. She has been an active participant in the ISO and ANSI groups responsible for developing the CGI and is the ISO/IEC JTC1/SC24/WG3/CGI Rapporteur.

1 INTRODUCTION

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2 OVERVIEW OF GRAPHICS STANDARDS

2.1 A Reference Model

A number of computer graphics standards have been proposed to address the needs of application and system programmers in creating, modifying, and manipulating graphical pictures. These standards provide bases for development that minimize the effort needed to accommodate a variety of needs. One common goal of these standards is to enhance the portability of programs and programmers between installations and environments.

An application programmer's interface (API) standard specifies a set of operations on a variety of graphic objects. An API standard provides for the portability of applications across a wide range of computer hardware, operating systems, programming languages, and graphics devices. A program written to an API standard at one facility, in a particular environment, should be easily transferable to another facility, in a different environment. Facility dependencies should be the major area requiring modification.

The specific functions supported by an API standard (as with any standard in general) depend on the needs to be addressed. Thus, the application programmer, by identifying the needs to be addressed, establishes which API is better suited for his application.