SITUATED COMPUTING:
A NEW PARADIGM FOR DESIGN COMPUTING

John S GERO

Professor of Design Science, University of Sydney
Visiting Professor in Design and Computation, MIT

Abstract:

Computer usage in design has largely been in the areas of document production, 3D modelling and to a lesser extent in specialised design analysis and design synthesis tasks. This use of computers by designers has been based on well-defined practices that have their genesis in the scientific approach to knowledge. Just as knowledge is independent of its use and independent of its user, so computer programs are designed to be independent of their use and independent of their users. This talk presents a complementary paradigm based on the notions of situated cognition as the basis of the development of new kinds of computational design tools.

Situated cognition holds that where are you and when you are there matters and that the state you are in affects what you do. The fundamental difference is between encoding all knowledge prior to its use to allowing the knowledge to be grounded in the interaction between the computational system and its environment. In addition to the concepts of situated cognition there is another important concept called constructive memory. *Constructive memory* changes our view of "memory" in a computational system from being a thing in a place that can be accessed with the correct index to being a process that produces a "memory" when needed. Thus, memory is constructed as needed and becomes a function of both the question it is used to respond to and the situation within which it was asked. These concepts provide the foundation for the development of novel tools to support computer-aided designing.

Examples of situated cognition and constructive memory will be presented. This will be followed by examples of situated design analysis and situated computational design creativity.