AUGMENTED PALEONTOLOGY: MERGING FOSSIL SPECIMENS WITH COMPUTER GENERATED INFORMATION FOR ANALYSIS AND EDUCATION

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Augmented Reality (AR) is a revolutionary interface that enhances the real world with synthetic supplements. AR allows virtual data, such as 3-D computer graphics, to be presented directly within a real environment rather than on a flat monitor. Over the last 40 years, technological advances have continued to blur the boundary between real and computer generated worlds. We have coined the term Augmented Paleontology to refer to the application of AR to paleontology. The goals of this technology are twofold: 1) to support paleontologists in their research, and 2) to communicated the results of these studies to museum visitors in an exciting and effective way.

Two case studies that combine physical fossil specimens with computer graphics will be presented. First, a cast skull of *Deinonychus* has been augmented with 3-D computer models of reconstructed soft tissues and missing bones. The real and virtual components can be perceived together in stereo from any perspective using a special high-resolution AR display device—the Virtual Showcase. AR provides the opportunity to test models of soft-tissue anatomy by assessing the conformational relationships (packing) of reconstructed components. Second, a cast dinosaur footprint has been augmented by an animated 3-D model of a theropod foot skeleton. This example illustrates how the distinctive shape of the track was likely produced and allows foot motion to be reconstructed.