Quantitative Analysis of Qualitative Images†

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Recently, renowned artist David Hockney observed that certain drawings and paintings from as early as the Renaissance seemed almost "photographic" in detail.[1] Following an extensive visual investigation of western art of the past 1000 years, he made the revolutionary claim that artists even of the prominence of van Eyck and Bellini must have used optical aids. However, many art historians insisted there was no supporting evidence for such a remarkable assertion. In this talk I will show a range of optical evidence for his claim that Hockney and I subsequently discovered during an unusual, and remarkably-productive, collaboration between an artist and a scientist.[2,3] These discoveries convincingly demonstrate optical instruments were in use—by artists, not scientists—nearly 200 years earlier than previously even thought possible, and account for the remarkable transformation in the reality of portraits that occurred early in the 15th century.

As the examples in my talk will show, paintings are much more complex than if projected images simply had been traced. The new image analysis insights Hockney and I developed in our collaboration enabled us to overcome this complexity, allowing us to extract information that had eluded generations of scholars.[4] Because of this, these discoveries have significant implications for the fields of machine vision and computerized image analysis as well as for the histories of art and science.

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[3] Additional information, and pdf files of Ref. [2] and our other publications, can be found at: http://www.optics.arizona.edu/ssd/FAQ.html