

**Stanford/NASA-Ames Center of Excellence
in Model-Based Human Performance**

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The human operator plays a critical role in many aeronautic and astronautic missions. The Stanford/NASA-Ames Center of Excellence in Model-Based Human Performance (COE) was initiated in 1985 to further our understanding of the performance capabilities and performance limits of the human component of aeronautic and astronautic projects. Support from the COE is devoted to those areas of experimental and theoretical work designed to summarize and explain human performance by developing computable performance models. Our ultimate goal is to make these computable models available to other scientists for use in design and evaluation of aeronautic and astronautic instrumentation.

The COE currently provides a portion of the research support of four principal investigators (Pavel, Rumelhart, Shepard, and Wandell). During the last three years more than ten graduate students and post-doctoral students have participated in the research supported by the COE. The research interests of the participating faculty members and students range across the areas of vision science, cognitive science, and neural networks.

Within vision science, two topics have received particular attention. First, we have done extensive work analyzing the human ability to recognize object color relatively independent of the spectral power distribution of the ambient lighting (color constancy). The COE has supported a number of research papers in this area, as well as the development of a substantial data base of surface reflectance functions, ambient illumination functions, and an associated software package for rendering and analyzing image data with respect to these spectral functions. The software and data base of reflectances have been distributed to laboratories around the world.

Second, the COE has supported new empirical studies on the problem of selecting colors for visual display equipment, such as CRTs, to enhance human performance in discrimination and recognition tasks. Classic color metric work, which is often used to define color specifications on visual display equipment, was performed using tasks that are inappropriate for the viewing conditions experienced by pilots. At the suggestion of our colleagues in the Vision Group at NASA-Ames, we have conducted new experiments that extend the range of measurement conditions to bring them closer into alignment with the viewing conditions encountered in flight.