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# Press Release - Biometric Exhibition 2010

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Tandent Introduces

# Trillien™

## Revolutionary Preprocessors That Enable

### “Computer Vision Everywhere”®

October 20, 2010, London. Today, at London Biometrics 2010, Tandent Vision Science, Inc. demonstrates **Trillien**, a revolutionary preprocessor technology and a major breakthrough for the computer vision industry. **Trillien** dramatically improves the performance of computer vision systems in the uncontrolled illumination of the real world and enables practical computer vision in myriad new settings.

**Trillien** operates on the just-captured image to provide a greatly enhanced input for all varieties of computer vision algorithms. Inspired by fundamental new insights about illumination perception in our human vision laboratory, **Trillien** is the result of 60 person-years of R&D and the subject of nearly forty pending and issued patents.

Whereas humans perceive a world of invariant objects under a varying “veil of illumination,” computer vision systems have traditionally had significant difficulty differentiating changes in lighting from changes in the physical properties of objects or scenes. Thus, an object imaged under many different illumination conditions, an object that would appear invariant to a person, may appear to a computer vision system as many different objects, which greatly complicates the recognition process. Laboratory systems that work well with controlled lighting can fail miserably in the real world.

### Computer Vision Everywhere

**Trillien** preprocessors solve this problem which has greatly limited real-world deployment of computer vision systems. **Trillien** factors a single image from any off-the-shelf digital camera into two images: one represents invariant surfaces and the other represents the spatial, spectral, and temporal variation in scene lighting (see Figures).

Whatever the actual environmental lighting, **Trillien** produces output images that are comparable to images captured in controlled, laboratory-perfect lighting without undesirable cast shadows, inter-reflection, or conspicuous shading.

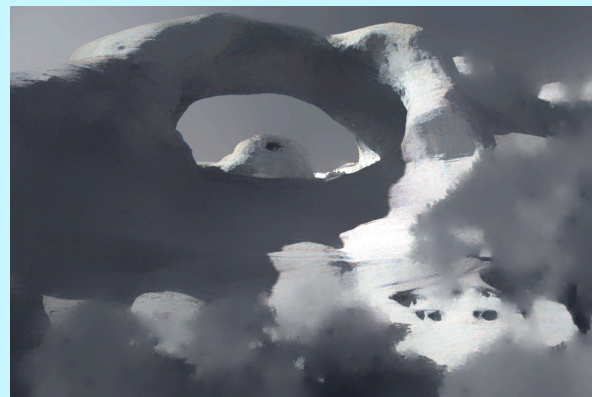
**Trillien** preprocessors are being designed for a variety of computer vision applications including face recognition, object recognition, optical character recognition, tracking, surveillance, visual search, mobile robotics, assisted driving—any application where illumination cannot be controlled. In short, variation in the spectral or spatial distribution of illumination is no longer a problem. **Trillien** makes it possible to pursue high-performance computer vision everywhere.



**Original Image**



**Trillien Reflectance**



**Trillien Illumination**

This image of a natural arch formation located in the Black Ridge Canyon Wilderness, near Grand Junction, Colorado, shows how **Trillien** splits a just-captured image, shown on top, into separate representations of surface reflectance (left) and an overlying “veil of illumination” (right). Inspired by fundamental new insights into the workings of human perception, **Trillien** solves a longstanding problem that has limited practical application of computer vision. Without **Trillien**, computer vision algorithms operate on imagery in which light and surface are fundamentally confounded and systems fail because objects do not have a consistent appearance.

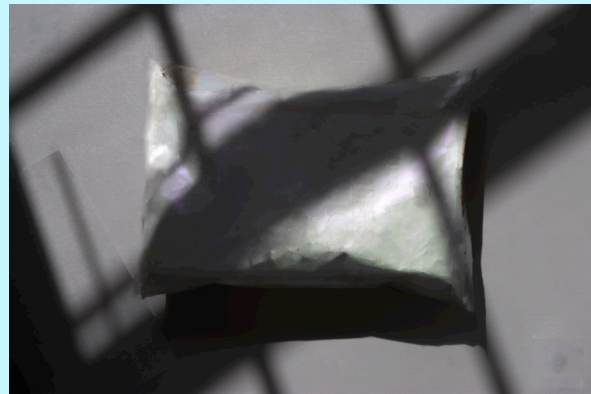
Whatever the original illuminating conditions, **Trillien** produces images similar to those produced by laboratory perfect lighting. Thus, computer vision systems that perform well in ideal lighting can now perform well in uncontrolled, real-world lighting.



Original Image



Trillien Reflectance



Trillien Illumination

**One of the most important current applications for Trillien is object recognition. Here Trillien factors the original image of an object with extreme shadows (top) into separate representations of surface reflectance (left) and illumination (right). The reflectance image depicts a largely invariant object irrespective of shadows or other spatial, spectral or temporal variation in scene illumination greatly simplifying the recognition process. Shape features present in the illumination image can also be used to aid the recognition process now that they are available as inputs for computer vision systems.**

## About Tandent

Tandent Vision Science Inc., founded in 2005, is a privately held computer vision research and development company headquartered in San Francisco with research facilities in San Francisco, New York, Pittsburgh (adjacent to Carnegie Mellon University) and Portland, Oregon.

Tandent was founded to solve fundamental problems limiting growth of the computer vision industry. Tandent is investing heavily in computer vision and believes that computers that can see will have a broad impact on the computer industry and the world. Tandent pursues both human vision research

as well as computational computer vision and is committed to playing a central role in the growth of the global computer vision industry.

## Contact Information

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### Career Opportunities

Tandent Vision Science Inc. is a unique research and development company that has attracted an outstanding group of scientists including distinguished academic researchers, accomplished industrial scientists, and some of the most outstanding recent graduates in the field of computer vision. If you are interested in working with us, please visit our website for more information.

### Other Information

For other information about our company, please visit our website [www.tandentvision.com](http://www.tandentvision.com)