

# Computers that See



**Nuno Vasconcelos**  
Professor, Electrical and Computer Engineering

## CURRENT RESEARCH

Providing the average individual with tools that train computers to perceive complex visual scenes

Dr. Nuno Vasconcelos and his research team at University of California, San Diego are integrating machine learning with computer vision to provide machines the visual capabilities of a human -- allowing it to make smart inferences based on what they "see." With Dr. Vasconcelos' technology, computers will be able to reach conclusions about photographs and videos. Imagine that you are walking in the woods and stumble upon a mysterious fruit. By simply taking a photo of the red berry you can quickly gain access to vital information such as, "Okay to eat" or "Place back down unless upset bowels desired."

Although significant progress has been achieved in object recognition over the last decades, the "red berry scenario" is only hypothetical at this time. While a "red berry" classifier could be designed with current technology, this design requires significant expertise in computer vision. Hence, it is only cost-effective for a few objects of interest for applications of large commercial interest (such as faces or people). There is very little incentive to design a "red berry" detector, when the majority of the population does not walk the woods. On the other hand, the average person can identify up to 70,000-80,000 objects. Dr. Vasconcelos believes that recognition at this scale, involving many thousands of objects, will only be possible if non-expert individuals become involved in the design process.

- Dr. Vasconcelos is currently developing technologies to enable non-computer vision experts to design computer vision algorithms through the use of a downloadable application. Current emphasis is on object detection.
- How does it work? Two steps: A data collection...

## AFFILIATION

 University of California, San Diego

## EDUCATION

- Ph.D., in Media Arts & Sciences, 2000 , Massachusetts Institute of Technology
- M.S., in Media Arts & Sciences, 1993 , Massachusetts Institute of Technology

## AWARDS

- Hellman Fellowship, 2005
- NSF CAREER Award

## RESEARCH AREAS

Technology, Computational Sciences / Mathematics, IOT, Devices, Data

## FUNDING REQUEST

Donations will be utilized for gathering the correct talent and required resources and equipment needed to create a digital application that searches for and identifies specific unknown objects. Your dollars will produce tools that allow data collection for a variety of images and then videos, will then lead to mass computer vision advocacy.

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