

Dear Faculty, IGERT Fellows, IGERT Associates and Students,

You are cordially invited to attend a Seminar presented by Gustavo Olague.  
Please plan to attend.

## Gustavo Olague

Date: Friday, May 9, 2014  
Location: Bourns A265  
Time: 11:00am

### Brain Programming for the Evolution of an Artificial Dorsal Stream

**Abstract:** This work describes the application of a new strategy called brain programming for automating the design of visual attention (VA) models. Nowadays, a term known as cognitive vision coined within the computer vision and cognitive research communities has been introduced to delimitate the kind of computer vision systems that are robust, resilient and adaptable to the task at hand through the incorporation of cognitive abilities. In particular, visual attention is considered as a critical factor whose main goal is to establish a relationship between the different properties or features of the scene with the aim of selecting the most suitable aspects for the task at hand. This paper follows a main trend in cognitive computation where the visual pathway is modeled through a succession of levels or layers. Here, the VA task is defined with the idea that several areas of the brain are in charge of its functionality in a hierarchical way. To achieve such functionality, we propose that an artificial process, mimicking the natural counterpart, would be charged of looking for a set of complex operations using an optimization/search process. The idea is to include such operations within a VA model that will be evolved according to a specific task. The aim of the whole process is to provide with the best solutions among the space of possible visual attention programs (VAPs) for a given problem. In this way, the article presents a methodology for automating the design of VAPs. Therefore, the final design can be seen as a cognitive vision system that is engaged in a purposive goal-directed behavior. The results obtained on a well-known testbed confirm that the proposal is able to automatically design VAPs that outperform previous manmade systems developed by VA experts, while providing readable results through a set of mathematical and computational structures.

**Biography:** Gustavo Olague is a research scientist at the [CICESE](#) Research Center working within the [Computer Science Department](#) of the [Applied Physics Division](#). He received his Ph.D. in Computer Graphics, Vision and Robotics from [Institut National Polytechnique de Grenoble, France](#). He is presently a Professor of Computer Science at Centro de Investigación Científica y de Educación Superior de Ensenada, B.C. Olague's research focuses on the principles of computational intelligence applied to close-range photogrammetry and computer vision.

