

POSITION ANNOUNCEMENT

**Research Assistant
Pattern Recognition and Image Processing
Ecovision Project
Earth System Initiative
Massachusetts Institute of Technology**

The ability to identify individual animals is essential to many research endeavors in biology. In field studies, for example, biologists rely on multiple observations over time and space to quantify population sizes, demographic rates, habitat utilization, movement rates and distances. Addressing these types of issues is often critical not only to basic ecological and evolutionary studies but also to inform conservation planning or natural resource management decisions, in many cases involving rare and endangered species. The emergence of cheap, high quality digital photography makes it possible to document the movements of large numbers of individual animals in species in which traditional methods are not practical.

As a leader of the rapidly growing ecovision community, we develop computational tools for biologists to query image databases on an unprecedented scale. Our methodology focuses on recognizing surface markings using generic visual features that can be adapted to different species, and algorithms that assist the user in a semi-automated identification process.

Pursuant to NSF funding for developing vision-based tools for conservation biology, MIT Earth System Initiative's Ecovision project seeks a research assistant in Pattern Recognition and Image Processing. Research can either be in a new direction or improve the existing prototype. Topics include imaging systems, segmentation, specularities, deformations, visual features, spatial representations, statistical inference, indexing high-dimensional features, and relevance feedback. Algorithms will be applied to data collected in the field including pictures of salamanders (marbled, spotted, tiger etc.), Fowler's toads, sharks and whales. More species will be added as the ecovision collective grows. We will hand off new software prototypes to developers in the community and publish the research results in ecology, image processing or computer vision journals.

There is **one** research assistantship starting Winter 2008 that supports research on any topic(s) agreed to from the aforementioned list. This position can be adapted to different needs. You could be an undergraduate looking for a senior project continuing onto an MENG topic, a graduate student looking for a master's topic, an early PhD student seeking to try a new area, or an intermediate PhD student in vision or stochastic systems looking for new applications.

An ability to code in C/Java/Matlab, and a solid understanding of linear algebra and signal processing is essential. Knowing estimation, control, optimization, or statistical modeling would be fantastic. Additional experience in computer vision, image processing, or image databases would be perfect. A passion for the earth's environment or ecology, priceless.

To apply, please send a CV including two references to Sai Ravela (ravela@mit.edu).