



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

<b>Name(s)</b> <b>Andrew B. Nazareth</b>	<b>Project Number</b>  38212
<b>Project Title</b> <b>Extracting Wildlife in Puma Project Photos Using Java</b>	
<b>Abstract</b> <b>Objectives/Goals</b> As part of the Summer Internship Program in Environmental Studies, at the University of California Santa Cruz last summer, I manually tagged a number of images which had wildlife in them. As this was time consuming, I was curious if I could automate this process. My objective is to develop a Java program to extract changes in images from the Puma Project footage to help identify wildlife found in the Santa Cruz Mountains. This program compares the pixels between two successive images in the Puma footage stream to highlight the presence of animals. <b>Methods/Materials</b> The Puma Project footage was obtained using motion sensitive cameras monitoring wildlife. The program to extract the animals (from two successive images) was written in Java, using the Eclipse platform. The user interface was created using JavaFX with Scene Builder 2.0. Four steps were coded to extract changes in the images. 1. Converting image(s) to greyscale. 2. Creating a new image that was the 'difference' of two input (color/greyscale) images. 3. Creating an adjustable filter to mask out the identical portions of the images 4. Applying the mask to the original image to extract the wildlife. <b>Results</b> I was able to extract the animal from the background images using my program. I ran the program on 20 sets of the images from the Puma Project footage. The masked image provided the best results. The mask value that provided the best extracted image varied across images. It was not easy to recognize animals in the 'difference' image. Operating on greyscale versions of the images did not change the results significantly. <b>Conclusions/Discussion</b> My program demonstrates that it is possible to automate the tagging process from two successive images. It met my objective for this project, where my program using Java can extract an animal/object from a background image.	
<b>Summary Statement</b> I coded a Java program to extract wildlife from Puma Project footage by comparing pixels from two successive images using the Eclipse platform and the user interface was created using JavaFX with Scene Builder 2.0	
<b>Help Received</b> Mr. Williams, Mr. Askins and my school project advisor, Mr. Johnson helped me get started with the Java programming, user interface design, and provided me with valuable advice. Veronica Yovovich, program mentor for my SIP Internship, gave me permission to use footage from the Puma Project.	